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can we rebuild an industry?

J KARL JUSTIN

One commonly expressed view about the high and increasing cost of building construction in the U.S. is that if only we would apply the mass production techniques which reduced the cost of the automobile so drastically, the problem would be resolved—a $50,000 house (analogous to a $50,000 hand-wrought auto) would be brought within reach of everyone for $600 down and $50 a month for three years. Or, at any rate, "assembly-line" techniques would bring huge cost reductions.

In fact, techniques ranging from total prefabrication of entire building modules (mobile homes, Habitat, etc.) to integrated combinations of components (heating-lighting-ventilation, roofing-structure-ceilings, roof-deck-power-supply-ventilation, etc.) have so far met with only limited success, in terms of the sought-after economic benefits. Probably the most successful have been the mobile homes, but at an obvious price in quality of life.

Specific undertakings aimed at developing new techniques and effecting major savings (such as the School Construction Systems Development project in California) have had less than a moderate impact on building costs. The scale of such efforts has admittedly enabled some new and better individual products to be created. Some manufacturers who participated have stopped marketing their developments, while others are selling them at a premium independently of the systems with which they were originally integrated.

Major city and federal efforts in mass-produced housing have likewise produced only questionable returns. In Detroit, where 40 or 50 companies were expected to compete for contracts for factory fabrication of homes, three companies actually entered the competition. Some of the designing was, to say the least, peculiar; a house with a second floor furnace room that could be reached only via an outside ladder, and one with but a single door, opening directly into the dining room, with the entryway closet ten feet away around the corner.

This is not to say that mass production techniques, in some form, may not be part of an answer to the question of how to reduce costs. But we must beware of adopting a method that has worked elsewhere without understanding the foundation of its success. If we want to emulate the successful techniques of more progressive industries, we should, more fundamentally, adopt their philosophies—goal-orientation, cost-effectiveness, and systems analysis—and use them with a full understanding of the *context* of building-industry operations. And we should remain open-minded: for example, it may be that the real benefits to be gained from improved methods are in areas other than costs.

So let us talk not just about building systems, but about building-*industry* systems. And let us begin with a brief survey of the environment of the building industry: the diversity of its products, the status of fields wholly or partially outside the building industry which affect it, and some of the implications, and validity, of the current desires of the customers.

THE PROBLEM OF VARIETY

It is not just a matter of building homes. As well as housing (low and high density) the industry must provide schools (elementary, secondary, and higher, with facilities for residence, administration, learning, storage, athletics, and fine arts); hospitals (special and general purpose, and research); stores and shops; offices; auditoriums; factories (plus storage and research facilities); and a miscellany of structures that fall into none of these categories.

Within any one use-category there are wide differences in methods of operation—differences relating to staff and service, traffic flow, personnel interrelationships, special equipment systems and the distribution of supplies—these choices being dependent on such considerations as budgets, integration with existing facilities, proclivities of administrators, and recent developments in the user's field. The result is a wide variation in types of facilities which, on the surface, would seem to have very similar needs.

Of course, there may still be enough volume in many of these subgroups to justify some form of standardization. But we see that the problem is quite a bit more involved than to be solvable by the development of a few factory-fabricated building units. If building systems are developed they must be far more numerous in their types and variations than one imagines on cursory inspection.

Either there must be systems for each distinct building category, or there must be subsystems basic enough to be interchangeable between categories. The degree of interchangeability is inversely related to the scale of the prefabricated units. In other words, if we have a building system which consists of four quarters of a school, to be put together on the site to form a whole, we are not likely to be able to use it for a hospital. If our school-building system consists of sections of walls, sections of roof, and other similar major components, we are more likely to be able to use it in building other types of structures, since the sections don't automatically form classrooms. At the other end of the scale, one can build almost anything with nails, lumber, bricks, and mortar.

Even if user requirements were virtually identical from building to building, there would still be substantial divergences from site to site: variations often arbitrary) among local building codes are the most obvious, but also important are variations in climate, in geology, in the availability and economics of utilities (gas, electricity, water, sanitary and storm sewers), in the supply of particular materials and the skills they require, and in accessibility.

These site-to-site variations suggest that there is a limit to how much of a building can be standardized. And a great economy in one part of the job may be only a small economy in the whole. It may be that even the most effective "breakthrough" would yield a final "rental" or "cost of ownership" saving of no more than 5 per cent, and that (except for housing) this gain would not really offset the loss of value associated with a more standardized (or less "customized") product.

It has also been argued that the cost of operating most buildings is so high compared to the cost of the physical structure that it is worthwhile putting up an expensive, individually designed building if it im-

proves operational efficiency. (Amortized over its life, with all costs fairly accounted, physical plant is usually only a few per cent of total annual operating cost—it is highest perhaps in housing.) But the effect of building design on operating costs is generally impossible to evaluate—which is perhaps more an indictment of cost accounting and management than of the building industry.

A limitation on the use of prefabricated parts is that their costs tend to be high if they have to be shipped over any distance. So there may have to be many local plants. There is also the question of whether the market for a building type or a subsystem will be geographically dense enough to call for "factories" of an economic size at economic spacings. The capital investment of setting up prefabrication facilities is, of course, substantial (and generally overlooked by the assembly-line romantic) and there is always the risk that a sleeping giant at the site will awaken. Many a new investment has foundered on the assumption that the competition would stand still.

THE BOUNDARY CONDITIONS

Cost savings, however, are not the only criterion. Savings,in time, greater accuracy, better workmanship, better maintenance, closer integration of work of different rates, simplified buying, interchangeability, demountability, and possibilities for controlling the obsolescence of the product—these are the real benefits promised by better techniques; and well worth going after. But it is clear that only very limited real progress can be made in construction techniques alone without reaching into other fields. It might be that, technically, the building industry is already nearly optimized, and that the only chance of substantial progress is to change the boundary conditions—operational, financial, legal, and political.

In the forefront of these is the bete noir of building: trade unions. A great deal more is involved here than simple recalcitrance toward labor-saving techniques and desire to avoid more demanding standards of craftsmanship.

It has been said that the true cost of building is the cost of labor plus material, plus the cost of labor's control over material. In the simplest kind of "innovation" dispute, a union local in one of the building trades refuses to install a labor-saving item. An example is the now famous "Philadelphia Door" case where the union mechanics refused to install 3,000 prehung doors called for by the architect's plans. An effort was made in the courts to compel the union to make the installation. When the matter was carried to the Supreme Court, it ruled in favor of the union.

As a result legislation has been proposed to prohibit unions from boycotting prefabrication. More recently, the National Labor Relations Board has ruled that such action against prefabricated materials constitutes a secondary boycott and hence is illegal. How the N.L.R.B. and the Supreme Court decisions are reconcilable is not clear, but these rulings in any case do not come completely to grips with the problem.

For one thing, they concern only prefabrication away from the site. There are many new methods that could profitably be introduced right at the job location. For another, there is a whole range of informal, unwritten tactics enabling unions to avoid the legal problems that would be created by a direct refusal to supply manpower.

So—written laws, court precedents, and labor-management contract provisions notwithstanding—the union local usually has the power of life or death over the business of a building contractor with whom it has an agreement. Today construction work is for the most part subcontracted by the general contractor to various specialty firms, each of which depends completely on a limited number of trades. A subcontractor seriously at odds with the union of his trade could find a miscellany of previously overlooked restrictions in his union contract, with an exceptional number of disputes, falling productivity of his work crews, unlooked-for delays, and so on. The result would be that he fails to meet his commitments, that his bids on new work must be too high, and that, undercapitalized as he probably is, he will soon be forced out of business. Beyond this, more than one overly loyal superintendent or employee has inadvertently fallen down an empty elevator shaft or had his skull fractured by a moving two-by-ten. The contractor therefore sees to it that his relationships with the unions are no less cordial than those of his competitors, and that any controversial innovations are fought for industry-wide if at all.

In view of all this, while there is a continuing effort on the part of the contractors to improve productivity, for the most part it takes the form of only minor changes from standard practice. There are enough hurdles for the contractor without embarking on any greater efforts to change the industry.

Should he or an innovative architect really wish to do so—with the cooperation of a courageous manufacturer and owner—he is contronted with the most crucial deterrent of all. He knows the written and the unwritten rules, and he knows that sometimes change will be allowed to occur if properly structured. But he cannot be certain of a specific change until he has gone through all the effort and investment of actually making it. He can get tentative nods before, but a union veto after the fact can bring the whole project to nothing. And there is no telling whether an innovation will be acceptable: the attitude of the union delegates is sphinx-like.

In short, anything more than a minor innovation requires one hell of a risk and possibly one hell of a fight, with costly aftereffects in the contractor's regular business. A motivation for such risk-taking might be generated by sharp competition, but the market is simply too profitable for that just now. And on the other hand, a shortage of work has an effect on the unions the reverse of what might be expected. Instead of increasing productivity to bring prices down and stimulate business, the tendency is to decrease productivity, featherbed, etc.

THE DIVISIONS OF LABOR

Complicating all this further is the division of building labor into many trades. (Ceiling contractors in New York, for example, are obliged to employ no less than nine separate trades to accomplish their no longer exotic work.) Any far-reaching changes in techniques—such as shop fabrication by union men working at field rates in the area of the local—will probably require reaching an agreement with the union locals of several trades.

The existence of these many separate divisions of trades also leads to jurisdictional disputes between them, with the contractor and owner caught in between. As an attempt to avert stoppages from this source, the National Joint Board for Settlement of Jurisdictional Disputes has run into killing fire from contractor associations and unions alike, not all of whom subscribed to it to start with. Its procedures are so slow that the job is finished before the Board reaches a decision (which will usually apply to the disputed job alone). Hence, any union having to avail itself of the Board is essentially out of luck, and the union will prefer to bring all other possible pressures against the contractor making the work assignment.

The main significance of this aspect of the problem is that the idea of cross-utiliza-

tion of building trades, without over-employment or featherbedding, is crucial to the creative development of techniques which transcend conventional demarcation lines.

One further impediment is the regional diversity of union practices. Since usually only one key man is allowed to be imported from one local to another, there can be no centrally trained, roving crews. Once a new practice is accepted by a local of a given trade, there is a better chance of its being accepted in other areas, but it is still only an improved probability. Even when national union leadership sees the benefit of certain changes over the long run, it is rarely able to advance their cause. The leadership may be enlightened, but the rank and file membership wants short-range results.

It must be clear by now that the problems which the innovator faces have their roots not merely in the building industry but in the entire structure of American labor law and its interpretation. He who attacks the sanctity of labor in the building industry must in some measure take on the entire labor movement in the U.S. Considering the voting strength of organized labor, this is not a hopeful prospect.

On the other hand, to shift work from one trade or union to another is more likely of success, and hence the factory-fabrication approach has certain appeal. At present factory labor is less costly and more pliable. One can only conjecture, however, as to how long any such discrepancy would last.

One essential ingredient of industrialization is the use of relatively unskilled labor rather than skilled craftsmen. But it is an error to conclude that unskilled labor can only be employed in a factory.

In a recent announcement from Detroit, it was indicated that a producer of housing units was completely factory-fabricating houses for shipment to the site, and installing them at a total cost 25 per cent less than the cost of houses completely built on site in the conventional manner. Later on in the announcement it was revealed that his factory labor, recruited from among unskilled Negroes, is costing him $2.50 per hour. (There was also a federal employee training subsidy.) Now, how long will he be able to hire factory labor for $2.50 per hour? And, just as an arithmetical exercise, how much cheaper would a *site*-fabricated house be with $2.50 labor and the same subsidy?

There is a clue in this, though, which may work for reducing costs of low-income housing—the idea of training the currently unskilled poor in the building trades, so that labor supply and demand in this area would bring labor costs more nearly into line.

In a somewhat different vein there is what Secretary of Housing and Urban Development Romney calls "sweat equity," whereby low-income housing buyers would be obliged to accomplish part of the finishing work themselves.

THE RELUCTANT MANUFACTURER

The idea develops very early in one's business experience that labor and risk are almost synonymous; that the safest item to merchandise is one involving more material and less labor. The larger, more conservative interests are happy to leave the construction field to those more willing to live with higher, short-term risk.

In fact, manufacturers generally have concentrated on rationalizing the raw-material end of their operations, have been decreasingly involved with the actual field situation, and have grown less able to integrate their product developments thoroughly. Most of the manufacturers' information on new product needs comes from their contractor customers via sales representatives. Under straightforward, logical circumstances, there would be no great need for the manufacturer's direct involvement in the use of his products. As it is, his assistance would be welcome; but he is too far removed from the action to be able to contribute much.

The labor situation and remoteness from the field are not the only limits on innovation by manufacturers. They are further restricted by the conventional "compartments" into which building components are grouped. Not only are subcontractors and mechanics grouped in this manner, but building codes, bidding procedures, and a thousand other daily practices are predicated on these divisions.

Certainly, in some undertakings, components have been combined. Roof-decking systems have been integrated with horizontal roof structural members; exterior walls with vertical structural supports; lighting with heating and ceilings. But even these broader divisions require large-volume installations in order to succeed, because members of all building trades involved must participate in the work, in a fixed ratio agreed upon by management and unions.

A further restriction here is that most public agencies are required by law to take separate bids at least on heating, plumbing, electrical, and general contract work. And finally, each building code is administered by a specialist local inspector who is prone to interpret even a uniform national code in his own individual manner, certainly viewing with suspicion any unconventional multitrade component. The design professions, too, are divided into separate specialties, although on a professional level communications are generally a little more open.

Not only is understanding and information inhibited this way, but also the manufacturers' ability to market products requiring special training or experience to install. Although in times past some manufacturers installed their own products (and some still do) a common practice was to distribute them through franchised installers, each of whom had an exclusive territorial right and was obliged to sell an interesting amount of the product or lose the franchise. (Since sales are related to product quality and proper installation, one of the best ways to sell the item is to see that it is properly installed. The franchisee also has a considerable interest in improving techniques or helping the manufacturer develop desirable new products.)

LEGAL BARRIERS

However, in recent years interpretations of antitrust law have placed the exclusive territorial franchise in the "restraint of trade" category. As a result, not only is a

major source of new product ideas being cut off, but only new products whose success is not too dependent on installation are created. The case where manufacturers have or acquire their own capability as part of their firm is also under a legal cloud. How these problems will relate to the "consortia" being established as part of the Department of Housing and Urban Development's "Operation Breakthrough" remains to be seen.

Another legal area having an effect on innovation is that of patents and their protection. There are several factors mitigating the value of patents. First, the basic life of a patent is only 17 years. In the construction industry, a new idea has to go through many slow stages before it emerges as a visible installation; by which time there may be less than 10 years of active life remaining to it. Of these, the last 3 years of any really successful building patent are riddled with violations (this being the length of time it takes to get an infringement dispute settled). And in any case (in the language of the legal fraternity) "the courts do not look kindly on patents." Rulings tend to be relatively liberal about what constitutes an interference and conservative about awarding damages.

Besides, the patent system is conceived in the first place to protect devices, whereas much of modern progress is in the area of ideas and system concepts—in software, rather than in hardware. The usual recourse—to cloak the idea or principle in a device and try to write as broad a patent as possible—is necessarily precarious.

Even success, rare as it is, has its penalties. There is at least one case in the building industry where a firm's patent was so successful that it created a virtual monopoly, by being so cheap as to make all competition incapable of competing. The company was forced to license others to manufacture the product.

ECONOMIC FORCES

We can now perhaps understand why investment in really radical changes is not apt to be overexuberant. And we have still not considered the financial forces that influence the choice between innovation and conservatism. A brief inspection will show that some of these influences work one way, some the other.

First, the cost of real estate and of assembling the proper parcels on which it is feasible to build buildings efficiently for the intended use is influenced not only by the density of population and the degree to which property is in demand, but perhaps even more by the zoning regulations pertaining to the property. In this sense, to some degree, property values are made by fiat.

Another important financial area is the cost that can be attributed to the nonusability of the land during the construction period. Real estate taxes continue and short-term construction financing is expensive. The sooner the new building is completed and in use, the better. It is in this area that any techniques for acceleration, whether organizational or technical, produce real financial benefit.

The cost of current purchase procedures for buildings is also a major factor. Organized purchasing for large groups of similar buildings has already shown its strength in terms of improved product, if not in cost reduction.

I have already mentioned another major cost—that of operating and maintaining the finished building. In this area also, improved techniques can make a major contribution by optimizing component life and serviceability.

Perhaps the most obvious single influence—since buildings are seldom paid for in ready cash—is the prime interest rate. Over a 20-year period the cost of aggregate interest payments is one of the same order as that of the building itself. In this light, a 1 per cent drop in the interest rate can produce far greater savings than can realistically be expected from the most radical change in construction methods.

Finally, another obvious influence is that of real estate taxes and assessments. Taxes are not only a direct cost but also have an influence on the age at which a building can most profitably be resold, and hence on how durable its components should be. Repairs are operating expenses and therefore tax deductible and, in varying degrees, preferable to high initial outlay.

Among the significant secondary influences, probably the most important of all, and the most inexorable in its working, is the requirement for balanced development of neighborhoods and cities. Housing accommodates the population which is the fuel for economic development; industrial plants are both support facilities and suppliers of purchasing power. Without a certain proportionateness, housing will be less than desirable, industry will lack high-quality manpower, and the stores will go begging. Our dying downtown centers reflect a dislocation of this balance. The helter-skelter success of suburban sprawl reflects a different kind of dislocation. Owing much to huckstering and to a lack of desirable alternatives, this temporary prosperity by no means insures us against future deterioration into gigantic suburban slums.

In the foregoing observations the subject of law has come up repeatedly—labor, antitrust, patent, tax, and zoning laws, as well as building codes.

There are still other legal areas that affect building, such as legislation for historical preservation, conservation, and fine arts commission or "architectural committee" review—which are well-meaning in their intentions but are often illogical or mean in the application. In New York City for instance, the facade of a legally designated landmark must be preserved, but the remainder of the building may be demolished and replaced. And many a town can

boast a review commission strongly influenced by local manufacturing interests or, worse, the unidentified inclination to increase property values by restricting newcomers. As a first glimmering of recognition of the significance of these constraints, a new Bar Association Special National Committee on Housing and Development Law has now been formed. Hopefully, similar attention to some of the other areas outlined above will also follow.

THOSE WHO DWELL THEREIN

Tracing the relationships between building and various facets of the law—which in our democracy is naturally contingent on the active or tacit support of the electorate—eventually leads us to examine our politics, ethics, and aesthetics in the largest sense. It raises the question, can the situation in the end be better than the participants in it?

One noted architect has remarked that if profits are to be derived from poor and ugly buildings, they will be built. But it also seems true that expensive buildings are constructed in preference to cheap ones on similar grounds. Before we build millions of standardized housing units, we should ask what premium the poor would in fact pay for custom housing? (How many of the poor have TV? Does the automobile owner in the low-income group drive the cheapest car on the market?)

The individual wants to make an input into his environment, and that includes his buildings. Will he welcome a single, universally imposed low-cost building breakthrough, however sagacious? In trying to provide for people, we must remember that they act as if there are greater goals to be sought than economy.

If we believe Veblen, we are barking up the wrong tree with *cheaper* building. The pecuniary canon of taste—conspicuous consumption—dies hard. The well-conceived and highly touted "new town" of Reston, Va. (financially rescued by Gulf Oil, in order to recoup a multimillion-dollar investment), had one major problem: its town houses—efficient, economical, well-designed town houses—were hard to sell. Did the buying public equate these with city row houses? In fact, will the public buy efficient, intelligent, balanced planning?

The market history of developments such as the telephone, television, the automobile, seems to follow a pattern: in the beginning the richest, who are the leaders of popular taste, pay for the expensive novelty; and society follows in imitation, generally getting a modified version. There may be a clue here. If affluence is, in fact, increasing at all levels and destined to continue in its growth as the think-tank seers predict, the key to the future may lie in making high-grade improvements in buildings, and letting the growth of purchasing power do the rest.

Suppose that rational optimization dictates the development of a disposable architecture—short-life "throw away" buildings; would the public still want brick fireplaces, and philanthropists continue to insist on colonnaded porticoes on public buildings? Suppose financial analysis dictates that the greatest housing economy comes from living high-rise in suburbia; will the public still want single-family housing on half-acre plots? Suppose the science of urban planning proves a need for flexible cities, segments of which can be demounted and updated to meet new conditions; will the public demand instead greater permanence?

In short, goal-orientation, cost-effectiveness, and the systems approach are techniques with their roots in rationality, which commend themselves to those disciplined in the application of reason. The rest of the world, and the strata with which the building industry must deal, are certainly willing to hail the results of technology and reason's output. But a very fundamental change is going to be needed before the bulk of the consuming public will actively participate in building-industry systems. Meanwhile, the taste of the buyer remains a massive unknown.

To sum up, there are an almost discouraging number of hurdles to be cleared if we are substantially to improve the utility of the building industry. It can be done, but we must seek the answers where they are apt to be found, not where the spotlight of public relations is brightest or the rhetoric most soothing.

Most disturbing of all, perhaps, is that we —as creative technologists—are faced with a new kind of problem. Most previous technological advances have been developed along with the new industries needed to exploit them. New developments were made by many small firms which grew—in a welter of activity in which successes were copied and failures learned from—into a large industry.

Here, the industry already exists, viscous with established practice and legal or quasi-legal restriction. The building problem cuts deep because we must alter existing methods and institutions, must face up to and painfully correct past errors. We are forced to replace an irrational structure with a rational one.

AUTHOR'S POSTSCRIPT

This article was actually written in 1969 and originally published in MIT's *TECHNOLOGY REVIEW* in May of 1970. A few things have changed somewhat, but in retrospect, I think the basic position is still sound. It is true that Detroit's first experiences with some rather bizarre proposals by prospective housing systems manufacturers have been superseded by better designs now in evidence; some produced by participants in the Department of Housing and Urban Development's "Operation Breakthrough." Large cost savings, however, are still on the "outskirts of hope." In any case, the matter of improved techniques in building construction is still a much more deeply involved subject than is advertised, and at best, to date, is largely an effort distorted by accepting as given many irrationally founded characteristics of related fields as well as irrational purchasing habits.

One idea that I should have emphasized more strongly is how the restrictive effect of current labor law and practice keeps the unskilled poor from finding their way into the building trades. Under free market conditions these high paying trades would attract many poorer paid workers or unemployed, reducing excessive construction wages by the operation of supply and demand; while at the same time helping to improve lower class and minority income and conditions.

Finally, another thought, which probably should have been expressed in the original article, is my disbelief in the so commonly treasured fantasy that progress in very complicated structures can be created by single magic "breakthroughs" or insights, simply by massive application of cash alone without regard to quality, skill, or soundness of input.

This article is copyright 1970 by the Alumni Association of the Massachusetts Institute of Technology.

J. Karl Justin is a Registered Architect, Licensed Professional Engineer, and Licensed Planner. He received his S.B. degree from the Sloan School's ancestor, M.I.T.'s Course XV, in 1948. He has spent about equal portions of his 20 years of experience in architecture, engineering, planning, building contracting, and building-products manufacturing and is currently Director of Projects Administration with Max O. Urbahn Associates, Inc., Architects and Planners, in New York City.

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FOURTH SESSION *Thursday, Aug. 12*

Virtue as Self-Directed Art 10:00 a m
Address by *Laszlo Versenyi* Philosophy-Williams College
Comment by *Rosco Hill* Philosophy-Yale University

FIFTH SESSION *Thursday, Aug. 12*

Towards a Politics of Homo Ludens: Libertarian Reflections on the Place of Aggression 2:00 p m
Address by *Kingsley Widmer* English-San Diego State Col.
Comment by *Michael Lerner* Philosophy-U C Berkeley.

SIXTH SESSION *Thursday, Aug. 12*

An Economist's View of the Individual 8:00 p m
Address by *Roger Miller* Economics-Univ. of Washington.
Comment by *Wallace I. Matson* Philosophy-U C Berkeley

NTH SESSION *Friday, Aug. 13*

a Technological Age 10:00 a m
y George Vick Philosophy-Cal. State, Los Angeles.
t by *Merrill Ring* Philosophy-U C Santa Barbara.

Reason. Consider the alternative.

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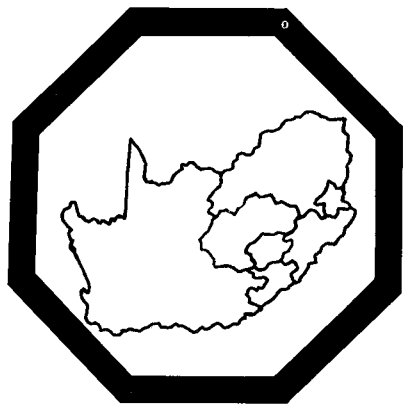
boycott



south africa ?

TERENCE HONIKMAN

Terence Honikman was born in Capetown and lived in South Africa until 1965 when he came to the United States after receiving his B.S. in mechanical engineering from the University of Capetown. He received his M.S. and Ph.D. (1970) degrees in aeronautical engineering from Stanford University and now resides in Santa Barbara, California, where he works for a research firm.

This article is about people, governments, and a particular form of governmental behavior made manifest in boycotts. On the international level, boycotts usually involve political or economic restrictions and constraints or at least threats of such. Sometimes a combined stragegy of limited actions and threats of harsher measures is employed. Throughout history, such attempts to control the behavior of nations and their people across international boundaries have been a shining example of the inability of coercive tactics to achieve their stated objectives. Yet actions such as boycotts continue to fascinate governments which, at the expense of their taxpayers, play their games with little or no understanding of the behavior of their opponents or of the mechanism which they attempt to employ. The purpose of this article is to explore the use of coercion in terms of boycotts and other similar measures, to attempt to explain their failures, and to consider alternative forms of expression.

Governmental boycotts illustrate Jay Forrester's concept of the counterintuitive behavior of complex systems [see "Counter-intuitive Behavior of Social Systems," page 14 of this issue—Editor]. His thesis suggests that, in dealing with social systems, what might at first appear to be a logical strategy to employ in order to achieve a given goal or objective often produces the wrong (and frequently just the opposite) effect or result because the strategy is based on a simplistic "intuitive" notion of the behavior of the system. Furthermore, such notions fail to recognise the important effects of apparently insignificant or unconsidered relationships and responses. Only in the case of simple systems (those with a small number, say less than five, of significant cause and effect inter-relationships or feedback loops) is our intuitive or "common sense" understanding useful enough to predict successfully their response.

Machinery provides many examples of simple systems, because machines are usually required to function in easily predicted patterns. A car will accelerate if the gas and air supply rates are increased and will decelerate if the brakes are applied (within the range of normal operating conditions). Complex systems have a larger number of significant cause and effect relationships than (most) human minds can accommodate. (The concept of accommodation is akin to seeing several moves ahead in a chess game, except that in the chess game the causes and effects are separated by time, or moves, but in most systems *many* feedback loops may be in operation at any given instant). When planning a strategy to effect a change in a complex system, a natural tendency is to disregard feedback loops in order to derive a simple system which then yields to a straight-forward or intuitive analysis. Feedback loops are often ignored because the planner is unaware of their significance, because by so doing, the list of complicated relationships is shortened.

ISOLATING SOUTH AFRICA

A striking example of the

inadequacy of the common sense approach occurred at the British Commonwealth Prime Ministers Conference in London in 1960. Although not a true boycott,it had all the major elements of one and for the purposes of this illustration may be considered such.

The leaders of several black member states opposed the (then) Union of South Africa's white supremacy policy of apartheid (literally "separateness"). They threatened Britain with a mass resignation from the Commonwealth unless Britain expelled South Africa. So poorly planned was this strategy that the fundamental goal (abolition of apartheid and white rule in South Africa) was subjugated to the emotional involvement of the threat and to the less significant and undefined goal of ousting South Africa from the Commonwealth. The resulting behavior of the South African Prime Minister, Dr. Hendrik Verwoerd, must have surprised all concerned. He dramatically preempted the black statesmen by withdrawing from the Commonwealth, thereby easing a potentially difficult and embarassing situation for Britain and completely deflating the sails of black brinkmanship.

The black threat was based on the belief that South Africa's survival depended on the salubrious economic association that existed between members of the Commonwealth. Faced with possible expulsion, it was felt that South Africa would alter its political course rather than succumb in the resulting economic solitude. Behavioral feedback loops abound in this example, but the important ones were exposed by the results of South Africa's resignation.

Firstly, Verwoerd was able to gain significant support in South Africa by showing how the black leaders were threatening all South Africans, black, white, brown, and yellow! This political maneuver resulted in a powerful vote of confidence for the government and further strengthened many of the bigotted arguments for apartheid ("irresponsible blacks are not fit to govern, etc.). Even the disenfranchised South Africans voiced pride in their "national identity," and a general wave of unity pervaded the streets for several months. The black leaders in the North failed to recognize the danger to their objective in their threat. A normal response to any theat, implied or expressed, is to dig in one's heels and fight back. The South African government was able to capitalize on this threat effect by offering to lead all threatened South Africans in their fight. The response to the political ploy was particularly sad to witness in the case of black South Africans, since their support was the result of a carefully organised public relations campaign (via government-owned media in some cases) aimed at taking advantage of the failure of the ill-conceived, though well-intentioned, plan of the Northern blacks to liberate their brothers in the South. By emphasizing the negative aspects of their plan, the South African government was able to achieve its objectives.

The second feedback loop that was not considered by the blacks actually contributed to South Africa's growth. By taking advantage of her new found freedom of trade outside the Commonwealth, South Africa was able to extend her markets and find market value prices for her expanding list of exports, rather than the artificially controlled "favorable" Commonwealth prices. The Republic of South Africa is today a far stronger and more independent state because of the black threat in 1960 than she might have been had she remained a Commonwealth member. Instead of toppling the white regime, these same black states have actually *contributed* to the problem as they perceived it by forcing the South African government to find and exploit new markets. Now, because they are completely cut off from contact with South Africa, these black states have lost any potential influence or control. Other nonwhite nations trade with South Africa, and each has made its mark on both her foreign and domestic policies.

In retrospect, the system involved in the black/white encounter *appears* to fit into the simple category, or at least its behavior has been explained by only two feedback loops. Although there were many more (which, while individually less significant than the above two, collectively played a supportive role), the important point to note is that these two responses were clearly not anticipated by the black leaders; else they would certainly have altered their plans. Even a simple model which included *only* the above two feedback loops might have shown the black leaders how weak their plan really was.

NEXT, RHODESIA

A second episode in which coercion failed miserably as a means of attaining stated objectives occurred between Britain and Rhodesia. Again, a racial problem provoked the boycott, but this time it was white against white, on behalf of blacks. After a cold period of threat and counter-threat, Ian Smith, leader of the ruling white minority in Rhodesia, declared unilateral independence in 1965 (Rhodesia was at that time a colony). In establishing his sovereign state, Smith defied the British Parliament who had threatened "dire consequences if Smith declared independence," and the world waited for all the worn-out power of that aging Empire to descend

on him. Instead of military force, however, Britain responded with a boycott, and, yes (you guessed it), after six years, Ian Smith still holds the reins of power in Rhodesia.

Britain attempted to control Smith's Rhodesia by exercising the economic muscles of the Commonwealth. By curtailing all trade with Rhodesia, Britain intended to bring Smith to his knees as vital commodities were exhausted. However Britain soon learned that she could control neither Rhodesia, nor other Commonwealth members, not to mention nonmember nations. Although many well-meaning countries around the globe joined Britain's crusade, there were always enough trading partners to ensure white Rhodesia's survival. Short of a naval and aerial blockade (both illegal under international law) not even British diplomacy could prevent free trade with Rhodesia. Furthermore, it would be strategically dangerous for neighboring South Africa to allow the white buffer state to fall, so that, in addition to the free trade reasons, there were strong political forces to prop up Mr. Smith's government.

It would appear, from Britain's unwillingness to use military force, that the expressed goal of toppling Smith was *not* valued very highly. However, it is reasonable to suggest that Britain realised the ultimate futility of exercising her military muscle, since Smith had garnered "total support" for his policies. (The white electorate voted their support while the black Rhodesians expressed their favor through the mechanism of "indaba," or tribal pow-wow. The reasons for the white support are clear, the blacks may have been persuaded by Smith's promises of increased chief's salaries and greater power and control over the distribution of land.) This second example clearly illustrates the impotence of boycotts, threats, and other coercive attempts at control.

One alternative might well be found in the judicious use of military force (Kennedy's Cuban blockade for example). However it is important to note that military force, if used to control the behavior of a people, is subject to the same shortcomings as a threat or boycott: by coercively conditioning a nation, the continued use of force is made obligatory. This is as true in Czechoslovakia as it is in the United States. No free-thinking people would contrive to behave in a subservient manner if the coercion were removed. (Kennedy was dealing with a governmental *body* rather than a nation of people, but the same arguments apply.) A far more effective *alternative* is communication, and one important vehicle of communication is trade. Several interesting examples illustrate how trade can influence behavior.

QUID PRO QUO

In applying apartheid, the South African government classifies all citizens by racial origin: whites, colored (mulatto), Bantu (black), and Asian. Each group is restrained by law from intercourse of any kind (except verbal, and that is socially restricted) with the other groups and from activity or presence within the other's group area (racially defined geographical sectors). Thus a black may *not* purchase beer in a white bar, etc. In recent years, the Japanese have become the principal purchaser of South African pig iron, and when their trade delegations visited the Republic, they were treated to a taste of life in South Africa, Asian style! None of the white amenities (such as hotels, transportation, and entertainment) were available to them since they were restricted by law to utilize nonwhite facilities. While white businessmen who knew them probably accorded them common courtesies, the average white citizen, including civil servants, probably treated the Japanese visitors as they would any other nonwhite South African—with obvious disdain. Furthermore, the well-cut suits of the Japanese businessmen would have "threatened" many white South Africans who are not used to seeing well dressed nonwhites.

Duly impressed, the Japanese suggested that they might seek other sources of pig iron unless they were treated in the manner to which they were accustomed elsewhere in the "civilised" world. The South African government was not about to lose an excellent market merely because of a little political philosophy, so they immediately labelled the Japanese visitors "honorary whites," allowing them access to most whites-only privileges!

This in itself was no great step forward for South Africa, and the Japanese were astute enough to realise that the compromise was a political strain domestically. But *both* sides agreed on the new arrangements, and now both Japan and South Africa share in the satisfaction of free trade.

In making this compromise, however, the absurdity of the racial policy was manifest for all the world (including South Africans) to see. As a result, white South African government officials (up to and including the Prime Minister) today entertain delegations from *any* nation that seeks commerce with South Africa. Trade with friendly black nations is actively pursued, and economic and other aid is continually made available to nations which need it. In summary, in attempting to generate an understanding and acceptance of apartheid, the South African government has learned to pursue a progressive trade policy, which, in turn, has caused noticible and significant modifications in the policy of apartheid.

A similar case of learning has occurred outside South Africa. The Polaroid Corporation, long a forward-looking and progressive company, has responded rationally to demands by the Polaroid Workers Revolutionary Committee that it cease trade with and in South Africa because of apartheid. Rather than merely accede, Polaroid dispatched a racially mixed employee committee to study the problem in South Africa. The goal is to study this experiment to see *if* it is possible to cease all dealings with the South African *government* by which the enforcement of apartheid laws is directly or indirectly aided, while at the same time continuing to trade and communicate with the South African *people*. For example, all sales and service activities related to Polaroid's ID-Two identification system (used in the passbooks or permits which all blacks are required to carry when in white group areas) will stop, while assembly of Polaroid sunglasses (in a South African factory which employs 200 blacks) will continue.

In this way Polaroid hopes to be able to express its antiapartheid corporate will meaningfully, while at the same time retaining valuable trade, and thus the opportunity to communicate. Not the least important aspect of this move is that 200 black families will continue to be employed and enjoy the associated upward mobility (however limited it may be) that they might otherwise be denied.

All too often well-meaning people and pressure groups react irrationally to what they consider to be a bad state of affairs. The Episcopal Church in the United States for instance, recently put General Motors on notice that it wanted that automaker's manufacturing activities in South Africa to cease (that church owns more than 12,500 GM shares). If the church really hopes to achieve the betterment of the black man's lot in South Africa, it should realise that what it has neglected in its latterday crusade is the effect of a GM pullout on the thousands of families (of all races) who depend on GM in South Africa and, more importantly, just how the South African government might respond. The trustees of Stanford University, who also control a large block of GM stock (about 23,000 shares), have urged GM to "do whatever is feasible to improve the conditions of nonwhites in South Africa," but they abstained from voting on the Episcopal proposal for the following reasons:

> We have abstained from voting against [GM on the South African issue] in order to avoid any possible implication of support for the policy of apartheid. We agree with the apparent intent of the proposal to oppose racial discrimination, although we do not agree with the steps it proposes to this end. We doubt that withdrawal from South Africa by General Motors now would significantly aid the cause of racial equality in South Africa or advance the welfare of nonwhites subject to discrimination there. Instead we believe that the corporation's greatest contribution to lessening racial discrimination in South Africa can be made by using all feasible means to combat racial discrimination.

This is an example of a reasoned approach to the problem, rather than an emotional or irrational one such as the church's.

Another example of reason was evident in the recent activities of the United Presbyterian Church. Last February, Gulf Oil (under pressure from UPC) included on its annual meeting agenda, four resolutions critical of Gulf's involvements in Mozambique and Angola, Portuguese colonies in southern Africa. Of the four, only one was negative (it would prohibit investments in colonial territories, period), while two sought to study Gulf's involvements in Africa (the fourth involved corporate structure).

The main point to note here is that reactions and policies need not be binary, full on or full off. They can and should be modulated to suit each situation so that maximum effectiveness can be achieved with a minimum of pain inflicted upon innocent participants in the system.

In summary, then, boycotts appear to be useful only in limited contests. They usually fail because of a poor understanding of the behavior of the many mechanisms of systems which are affected and even upset by boycotts. Very often an analytic approach will expose unexpected responses; however, boycotts are usually motivated emotionally and are thus not justified by serious rational thought.

Boycotts are by nature very general (rather than selective) in their sphere of influence, affecting not only the governments against which they are enacted but also individual citizens. Often the welfare of these people deteriorates, even though it is they whom the boycotters intend to help. Governments, like crusaders bent on "saving souls," would do well to realise the gravity of their policies and actions with regard to those they would aid.

Communication, as the effective alternative to boycotts and with trade as its means, can have positive and constructive (though unobtrusive) results. How might relations between the United States and the U.S.S.R. (not to mention between Americans and Russians) have developed had not the cold war of the 50s thawed? Consider the horizons now made visible by the State Department's recent easing of restrictions on trade and communications with China (and therefore with the Chinese people). Imagine, if you will, the potential results of a similar move of economic and cultural recognition with respect to Cuba.

Boycotts set people against each other. Free trade and communication bring people together for mutual benefit. Since there is no one to benefit mutually with the South African government in the maintenance of apartheid, contacts with that body for trading will accomplish what boycotts never have—the demonstration of apartheid's futility and stupidity. ●

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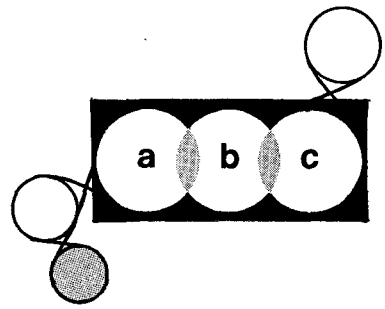
counterintuitive behavior of social systems



JAY W FORRESTER

PART TWO

EDITOR'S NOTE:

Part I of this article appeared in our July issue and readers are advised to read part I before beginning Part II. In Part I, Professor Forrester discussed the applicability of mathematical modeling to the description of certain key aspects of "social systems." All of his comments in Part II dealing with such matters as population, pollution, and industrialization refer to the specific model described in Part I (pp. 10-12)—not necessarily to the real world. Although Prof. Forrester believes that the assumptions and relationships in his model accurately represent reality, he would be the first to admit that the model is only as good as its underlying premises. Our purpose in presenting Prof. Forrester's article is not to endorse either his premises or his conclusions but rather to make readers aware of his method—system dynamics—as a powerful new tool for analyzing complex problems. Comments are invited.

ALTERNATIVES TO DECLINE OR CATASTROPHE

Suppose in the basic world system of Figures 1 and 2 we ask how to sustain the quality of life which is beginning to decline after 1950. One way to attempt this, and it is the way the world is now choosing, might be to increase the rate of industrialization by raising the rate of capital investment. Models of the kind we are here using make such hypothetical questions answerable in a few minutes and at negligible cost. Figure 4 shows what happens if the "normal" rate of capital accumulation is increased by 20 per cent in 1970. The pollution crisis reappears. This time the cause is not the more efficient use of natural resources but the upsurge of industrialization which overtaxes the environment before resource depletion has a chance to depress industrialization. Again, an "obvious" desirable change in policy has caused troubles worse than the ones that were originally being corrected.

This is important, not only for its own message but because it demonstrates how an apparently desirable change in a social system can have unexpected and even disastrous results.

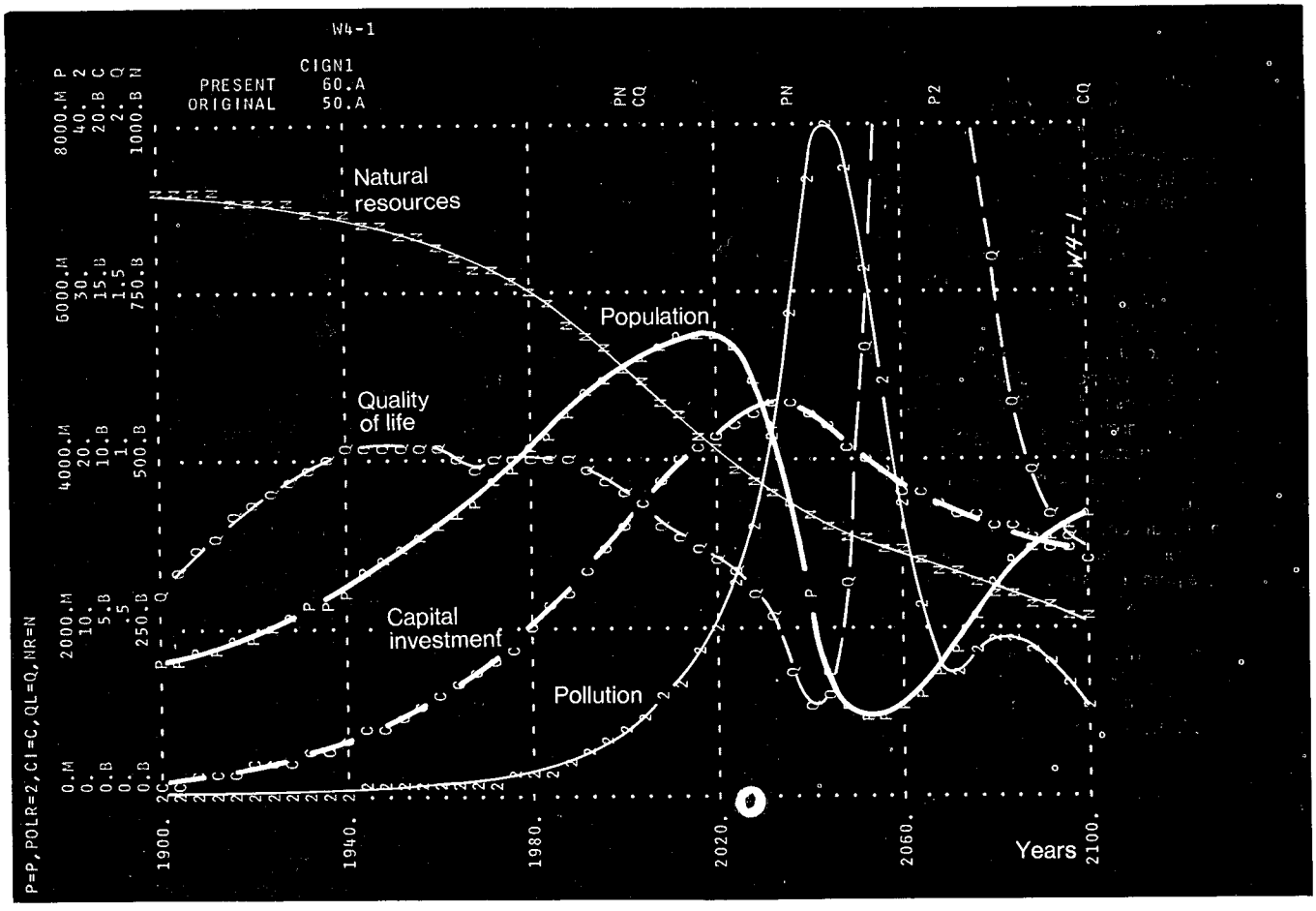
Figure 4 should make us cautious about rushing into programs on the basis of short-term humanitarian impulses. The eventual result can be anti-humanitarian. Emotionally inspired efforts often fall into one of three traps set for us by the nature of social systems: The programs are apt to address symptoms rather than causes and attempt to operate through points in the system that have little leverage for change; the characteristic of systems whereby a policy change has the opposite effect in the long run can eventually cause deepening difficulties after a sequence of short-term actions; and the effect of a program can be along an entirely different direction than was originally expected, so that suppressing one symptom only causes trouble to burst forth at another point.

Figure 5 retains the 20 per cent additional capital investment rate after 1970 from Figure 4 but in addition explores birth reduction as a way of avoiding crisis. Here the "normal" birth rate has been cut in half in 1970. (Changes in normal rates refer to coefficients which have the specified effect if all other things remain the same. But other things in the system change and also exert their effect on the actual system rates.) The result shows interesting behavior. Quality of life surges upward for 30 years for the reasons that are customarily asserted. Food-per-capita grows, material standard of living rises, and crowding does not become as great. But the more affluent world population continues to use natural resources and to accumulate capital plant at about the same rate as in Figure 4. Load on the environment is more closely related to industrialization than to population and the pollution crisis occurs at about the same point in time as in Figure 4.

Figure 5 shows that the 50 per cent reduction in "normal" birth rate in 1970 was sufficient to start a decline in total population. But the rising quality of life and the reduction of pressures act to start the population curve upward again. This is especially evident in other computer runs where the reduction in "normal" birth rate is not so drastic. Serious questions are raised by this investigation about the effectiveness of birth control as a means of controlling population. The secondary consequence of starting a birth control program will be to increase the influences that raise birth rate and reduce the apparent pressures that require population control. A birth control program which would be effective, all other things being equal, may largely fail because other things will not remain equal. Its very incipient success can set in motion forces to defeat the program.

Figure 4. *In 1970 the rate of capital accumulation is increased 20 per cent in an effort to reverse the beginning decline in quality of life. The pollution crisis occurs before natural resources are depleted.*

Figure 5. *In 1970 the 20 per cent increase in capital accumulation of Figure 4 is retained and "normal" birth rate is reduced 50 per cent. Capital investment continues to grow until the pollution crisis develops. After an initial decline, population is again pushed up by the rapid rise in quality of life that precedes the collapse.*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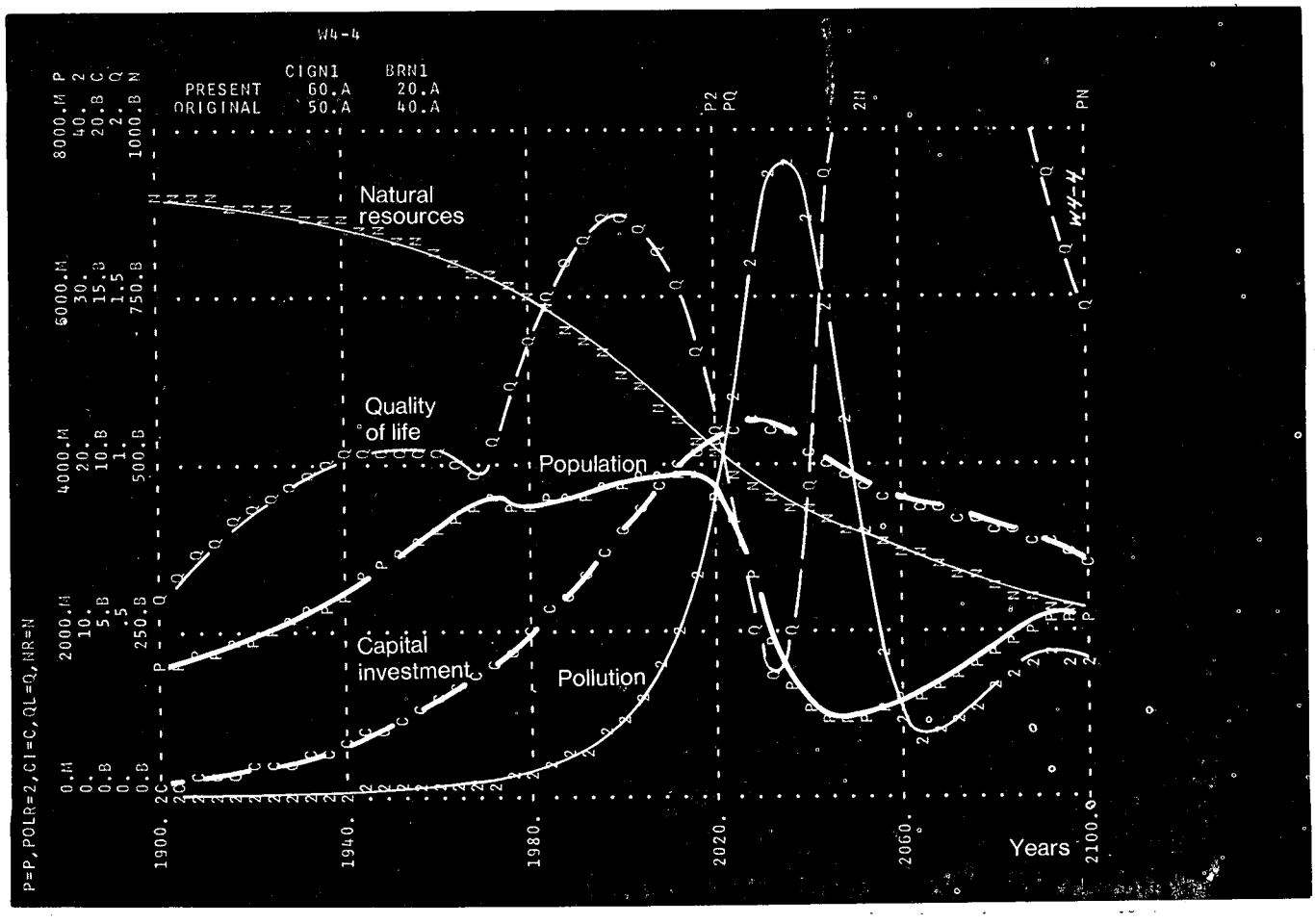
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Figure 6 combines the reduced resource usage rate and the increased capital investment rate of Figures 3 and 4. The result is to make the population collapse occur slightly sooner and more severely. Based on the modified system of Figure 6, Figure 7 then examines the result if technology finds ways to reduce the pollution generated by a given degree of industrialization. Here in Figure 7, the pollution rate, other things being the same, is reduced by 50 per cent from that in Figure 6. The result is to postpone the day of reckoning by 20 years and to allow the world population to grow 25 per cent greater before the population collapse occurs. The "solution" of reduced pollution has, in effect, caused more people to suffer the eventual consequences. Again we see the dangers of partial solutions. Actions at one point in a system that attempt to relieve one kind of distress produce an unexpected result in some other part of the system. If the interactions are not sufficiently understood, the consequences can be as bad or worse than those that led to the initial action.

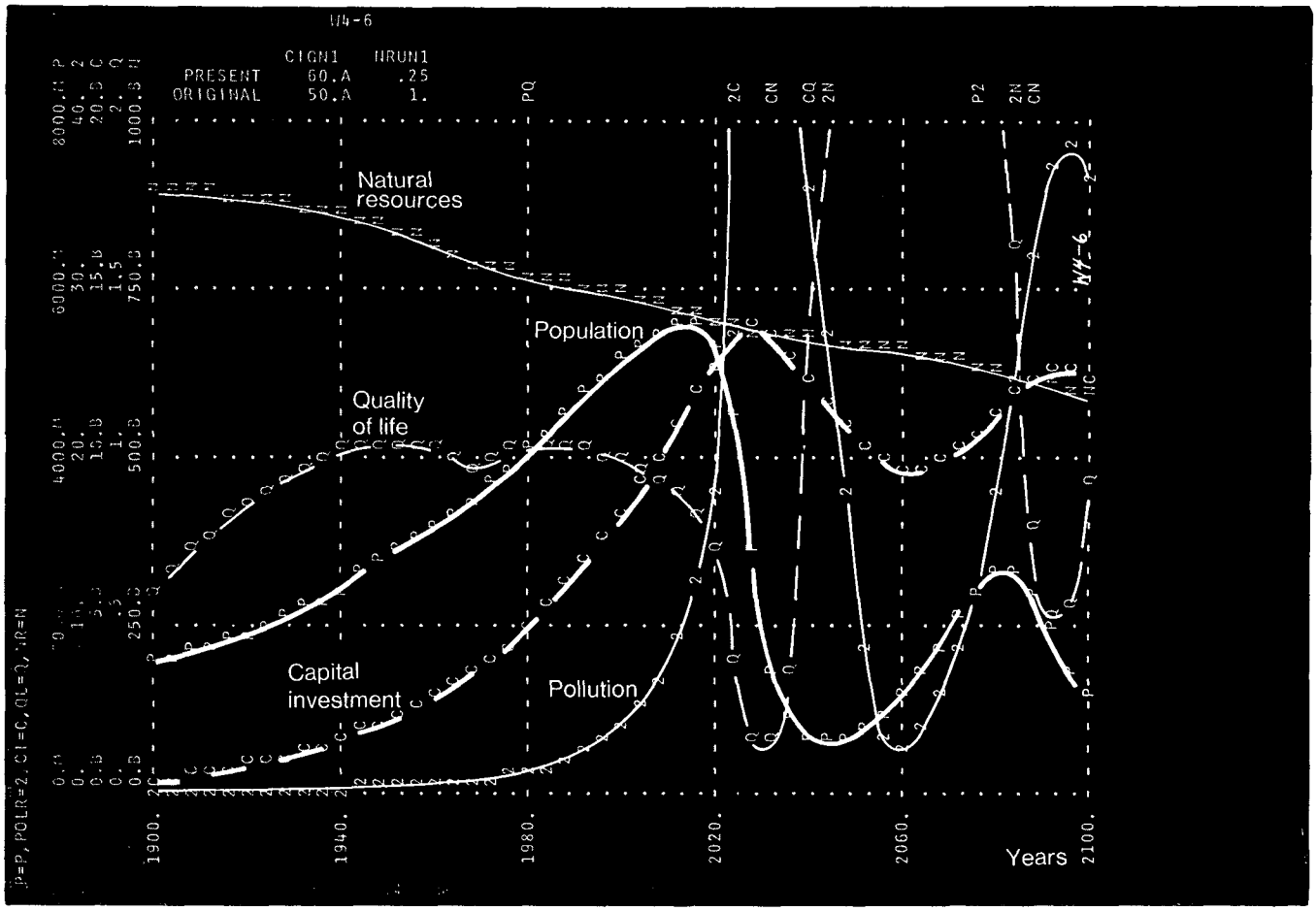
There are no utopias in our social systems. There appear to be no sustainable modes of behavior that are free of pressures and stresses. But there are many possible modes and some are more desirable than others. Usually, the more attractive kinds of behavior in our social systems seem to be possible only if we have a good understanding of the system dynamics and are willing to endure the self-discipline and pressures that must accompany the desirable mode. The world system of Figure 1 can exhibit modes that are more hopeful than the crises of Figures 2 through 7. But to develop the more promising modes will require restraint and dedication to a long-range future that man may not be capable of sustaining.

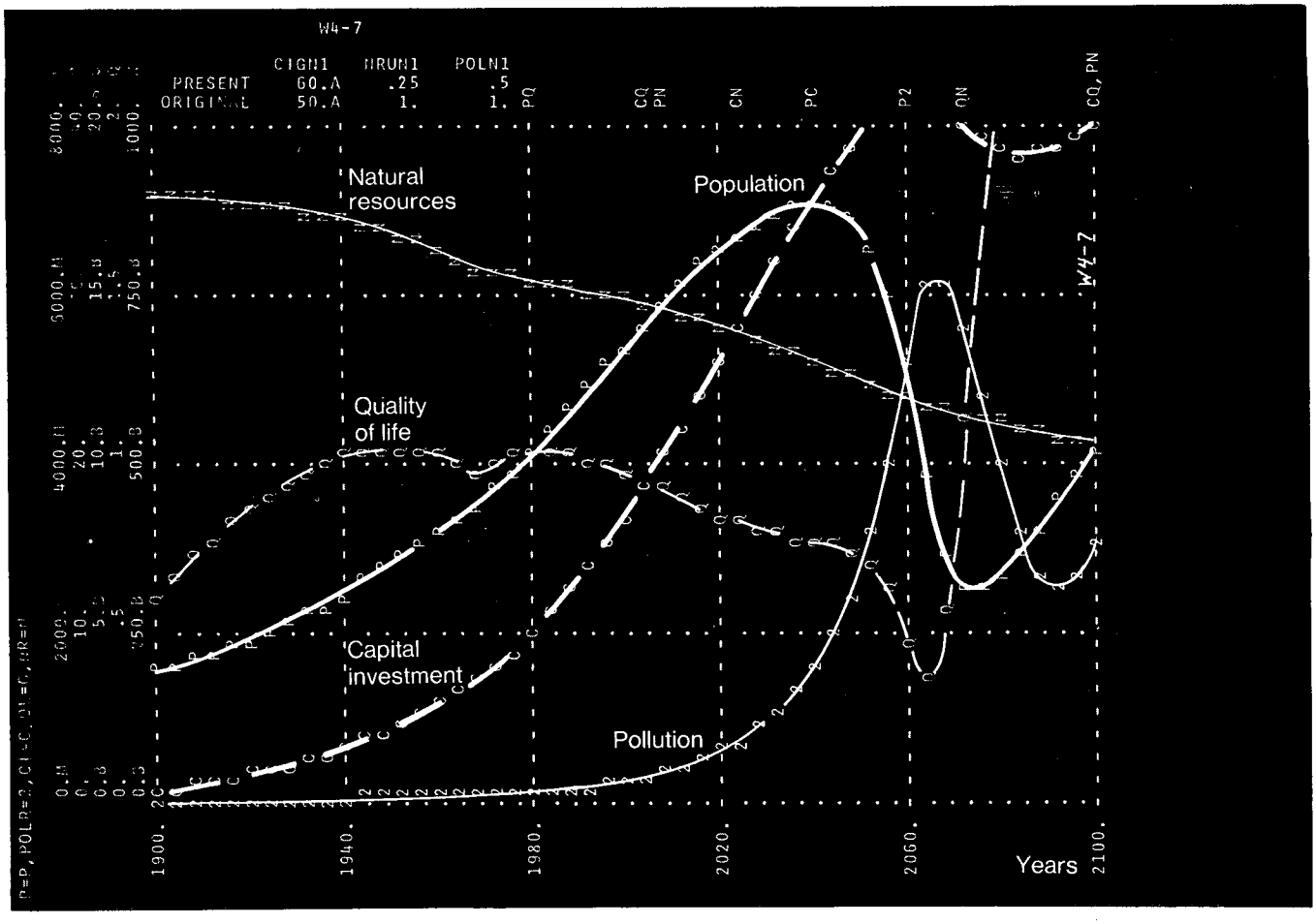
Figure 8 shows the world system if several policy changes are adopted together in the year 1970. Population is stabilized. Quality of life rises about 50 per cent. Pollution remains at about the 1970 level. Would such a world be accepted? It implies an end to population and economic growth.

Figure 6. *The 20 per cent increase of capital investment from Figure 4 and the 75 per cent reduction of natural resource usage from Figure 3 are combined.*

Figure 7. *Increased capital investment rate and reduced natural resource usage from Figure 6 are retained. In addition in 1970 the "normal" rate of pollution generation is reduced 50 per cent. The effect of pollution control is to allow population to grow 25 per cent further and to delay the pollution crisis by 20 years.*

Figure 8. *One set of conditions that establishes a world equilibrium. In 1970 capital investment rate is reduced 40 per cent, birth rate is reduced 50 per cent, pollution generation is reduced 50 per cent, natural resource usage rate is reduced 75 per cent, and food production is reduced 20 per cent.*

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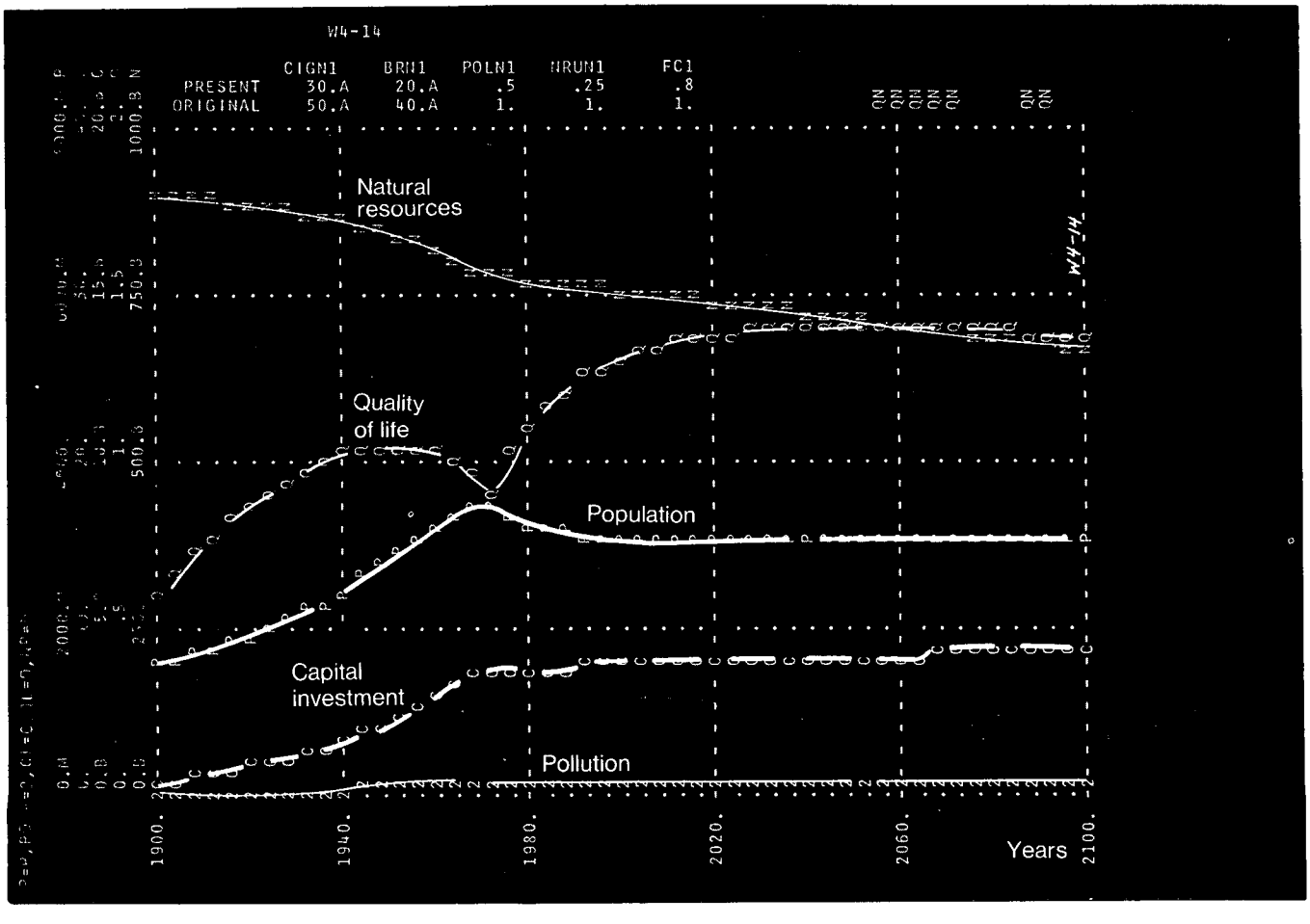
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In Figure 8 the normal rate of capital accumulation is *reduced* 40 per cent from its previous value. The "normal" birth rate is reduced 50 per cent from its earlier value. The "normal" pollution generation is reduced 50 per cent from the value before 1970. The "normal" rate of food production is *reduced* 20 per cent from its previous value. (These changes in "normal" values are the changes for a specific set of system conditions. Actual system rates continue to be affected by the varying conditions of the system.) But reduction in investment rate and reduction in agricultural emphasis are counterintuitive and not likely to be discovered or accepted without extensive system studies and years of argument—perhaps more years than are available. The changes in pollution generation and natural resource usage may be easier to understand and to achieve. The severe reduction in world-wide birth rate is the most doubtful. Even if technical and biological methods existed, the improved condition of the world might remove the incentive for sustaining the birth reduction emphasis and discipline.

FUTURE POLICY ISSUES

The dynamics of world behavior bear directly on the future of the United States. American urbanization and industrialization are a major part of the world scene. The United States is setting a pattern that other parts of the world are trying to follow. That pattern is not sustainable. Our foreign policy and our overseas commercial activity seem to be running contrary to overwhelming forces that are developing in the world system. The following issues are raised by the preliminary investigations to date. They must, of course, be examined more deeply and confirmed by more thorough research into the assumptions about structure and detail of the world system.

□ Industrialization may be a more fundamentally disturbing force in world ecology than is population. In fact, the population explosion is perhaps best viewed as a result of technology and industrialization. I include medicine and public health as a part of industrialization.

□ Within the next century, man may be facing choices from a four-pronged dilemma—suppression of modern industrial society by a natural resource shortage, collapse of world population from changes wrought by pollution, population limitation by food shortage, or population control by war, disease, and social stresses caused by physical and psychological crowding.

□ We may now be living in a "golden age" where, in spite of the world-wide feeling of malaise, the quality of life is, on the average, higher than ever before in history and higher now than the future offers.

□ Efforts for direct population control may be inherently self-defeating. If population control begins to result as hoped in higher per capita food supply and material standard of living, these very improvements can generate forces to trigger a resurgence of population growth.

□ The high standard of living of modern industrial societies seems to result from a production of food and material goods that has been able to outrun the rising population. But, as agriculture reaches a space limit, as industrialization reaches a natural-resource limit, and as both reach a pollution limit, population tends to catch up. Population then grows until the "quality of life" falls far enough to generate sufficiently large pressures to stabilize population.

□ There may be no realistic hope for the present underdeveloped countries reaching the standard of living demonstrated by the present industrialized nations. The pollution and natural resource load placed on the world environmental system by each person in an advanced country is probably 10 to 20 times greater than the load now generated by a person in an underdeveloped country. With four times as much population in underdeveloped countries as in the present developed countries, their rising to the economic level of the United States could mean an increase of 10 times in the natural resource and pollution load on the world environment. Noting the destruction that has already occurred on land, in the air, and especially in the oceans, no capability appears to exist for handling such a rise in standard of living for the present total population of the world.

□ A society with a high level of industrialization may be nonsustainable. It may be self-extinguishing if it exhausts the natural resources on which it depends. Or, if unending substitution for declining natural resources is possible, the international strife over "pollution and environmental rights" may pull the average world-wide standard of living back to the level of a century ago.

□ From the long view of a hundred years hence, the present efforts of underdeveloped countries to industrialize along Western patterns may be unwise. They may now be closer to the ultimate equilibrium with the environment than are the industrialized nations. The present underdeveloped countries may be in a better condition for surviving the forthcoming world-wide environmental and economic pressures than are the advanced countries. When one of the several forces materializes that is strong enough to cause a collapse in world population, the advanced countries may suffer far more than their share of the decline.

A NEW FRONTIER

It is now possible to take hypotheses about the separate parts of a social system, to combine them in a computer model, and to learn the consequences. The hypotheses may at first be no more correct than the ones we are using in our intuitive thinking. But the process of computer modeling and model testing requires these hypotheses to be stated more explicitly. The model comes out of the hazy realm of the mental model into an unambiguous model or statement to which all have access. Assumptions can then be checked against all available information and can be rapidly improved. The great uncertainty with mental models is the inability to anticipate the consequences of interactions between the parts of a system. This uncertainty is totally eliminated in computer models. Given a stated set of assumptions, the computer traces the resulting consequences without doubt or error. This is a powerful procedure for clarifying issues. It is not easy. Results will not be immediate.

We are on the threshold of a great new era in human pioneering. In the past there have been periods characterized by geographical exploration. Other periods have dealt with the formation of national governments. At other times the focus was on the creation of great literature. Most recently we have been through the pioneering frontier of science and technology. But science and technology are now a routine part of our life. Science is no longer a frontier. The process of scientific discovery is orderly and organized.

I suggest that the next frontier for human endeavor is to pioneer a better understanding of the nature of our social systems. The means are visible. The task will be no easier than the development of science and technology. For the next 30 years we can expect rapid advance in understanding the complex dynamics of our social systems. To do so will require research, the development of teaching methods and materials, and the creation of appropriate educational programs. The research results of today will in one or two decades find their way into the secondary schools just as concepts of basic physics moved from research to general education over the past three decades.

What we do today fundamentally affects our future two or three decades hence. If we follow intuition, the trends of the past will continue into deepening difficulty. If we set up research and educational programs, which are now possible but which have not yet been developed, we can expect a far sounder basis for action.

THE NATION'S REAL ALTERNATIVES

The record to date implies that our people accept the future growth of United States population as preordained, beyond the purview and influence of legislative control, and as a ground rule which determines the nation's task as finding cities in which the future population can live. But I have been describing the circular processes of our social systems in which there is no unidirectional cause and effect but instead a ring of actions and consequences that close back on themselves. One could say, incompletely, that the population will grow and that cities, space, and food must be provided. But one can likewise say, also incompletely, that the provision of cities, space, and food will cause the population to grow. Population generates pressure for urban growth, but urban pressures help to limit population.

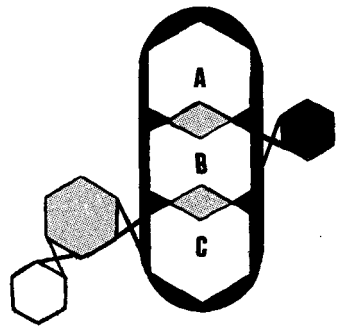
Population grows until stresses rise far enough, which is to say that the quality of life falls far enough, to stop further increase. Everything we do to reduce those pressures causes the population to rise farther and faster and hastens the day when expediencies will no longer suffice. The United States is in the position of a wild animal running from its pursuers. We still have some space, natural resources, and agricultural land left. We can avoid the question of rising population as long as we can flee into this bountiful reservoir that nature provided. But it is obvious that the reservoirs are limited. The wild animal usually flees until he is cornered, until he has no more space. Then he turns to fight, but he no longer has room to maneuver. He is less able to forestall disaster than if he had fought in the open while there was still room to yield and to dodge. The Unites States is running away from its long-term threats by trying to relieve social pressures as they arise. But if we persist in treating only the symptoms and not the causes, the result will be to increase the magnitude of the ultimate threat and reduce our capability to respond when we no longer have space to flee.

What does this mean? Instead of automatically accepting the need for new towns and the desirability of locating industry in rural areas, we should consider confining our cities. If it were possible to prohibit the encroachment by housing and industry onto even a single additional acre of farm and forest, the resulting social pressures would hasten the day when we stabilize population. Some European countries are closer to realizing the necessity of curtailing urban growth than are we. As I understand it, farm land surrounding Copenhagen cannot be used for either residence or industry until the severest of pressures forces the government to rezone small additional parcels. When land is rezoned, the corresponding rise in land price is heavily taxed to remove the incentive of speculation. The waiting time for an empty apartment in Copenhagen may be years. Such pressures certainly cause Danes to face the population problem more squarely than do we.

Our greatest challenge now is how to handle the transition from growth into equilibrium. Our society has behind it a thousand years of tradition that has encouraged and rewarded growth. The folklore and the success stories praise growth and expansion. But that is not the path of the future. Many of the present stresses in our society are from the pressures that always accompany the conversion from growth into equilibrium.

In our studies of social systems, we have made a number of investigations of life cycles that start with growth and merge into equilibrium. There are always severe stresses in the transition. Pressures must rise far enough to suppress the forces that produced growth. Not only do we face the pressure that will stop the population growth; we also encounter pressures that will stop the rise of industrialization and standard of living. The social stresses will rise. The economic forces will be ones for which we have no precedent. The psychological forces will be beyond those for which we are prepared. Our studies of urban systems demonstrated how the pressures from shortage of land and rising unemployment accompany the usual transition from urban growth to equilibrium. But the pressures we have seen in our cities are minor compared to those which the nation is approaching. The population pressures and the economic forces in a city that was reaching equilibrium have in the past been able to escape to new land areas.

But that escape is becoming less possible. Until now we have had, in effect, an inexhaustible supply of farm land and food-growing potential. But now we are reaching the critical point where, all at the same time, population is overrunning productive land, agricultural land is almost fully employed for the first time, the rise in population is putting more demand on the food supplies, and urbanization is pushing agriculture out of the fertile areas into the marginal lands. For the first time demand is rising into a condition where supply will begin to fall while need in-



creases. The crossover from plenty to shortage can occur abruptly.

The fiscal and monetary system of the country is a complex social-economic-financial system of the kind we have been discussing. It is clear the country is not agreed on behavior of the interactions between government policy, growth, unemployment, and inflation. An article by a writer for *Finance* magazine in July, 1970, suggests that the approach I have been discussing be applied in fiscal and monetary policy and their relationships to the economy. I estimate that such a task would be only a few times more difficult than was the investigation of urban growth and stagnation. The need to accomplish it becomes more urgent as the economy begins to move for the first time from a history of growth into the turbulent pressures that will accompany the transition from growth to one of the many possible kinds of equilibrium. We need to choose the kind of equilibrium before we arrive.

In a hierarchy of systems, there is usually a conflict between the goals of a subsystem and the welfare of the broader system. We see this in the urban system. The goal of the city is to expand and to raise its quality of life. But this increases population, industrialization, pollution, and demands on food supply. The broader social system of the country and the world requires that the goals of the urban areas be curtailed and that the pressures of such curtailment become high enough to keep the urban areas and population within the bounds that are satisfactory to the larger system of which the city is a part. If this nation chooses to continue to work for some of the traditional urban goals, and if it succeeds, as it may well do, the result will be to deepen the distress of the country as a whole and eventually to deepen the crisis in the cities themselves. We may be at the point where higher pressures in the present are necessary if insurmountable pressures are to be avoided in the future.

I have tried to give you a glimpse of the nature of multi-loop feedback systems, a class to which our social systems belong. I have attempted to indicate how these systems mislead us because our intuition and judgment have been formed to expect behavior different from that actually possessed by such systems. I believe that we are still pursuing national programs that will be at least as frustrating and futile as many of the past. But there is hope. We can now begin to understand the dynamic behavior of our social systems. Progress will be slow. There are many cross-currents in the social sciences which will cause confusion and delay. The approach that I have been describing is very different from the emphasis on data gathering and statistical analysis that occupies much of the time of social research. But there have been breakthroughs in several areas. If we proceed expeditiously but thoughtfully, there is a basis for optimism. ●

Suggested Readings

Jay W. Forrester, *Industrial Dynamics.* Cambridge: The M.I.T. Press, 1961.

Jay W. Forrester, *Principles of Systems.* Cambridge (238 Main St.): Wright-Allen Press, 1968.

Jay W. Forrester, *Urban Dynamics.* Cambridge: The M.I.T. Press, 1969.

Jay W. Forrester, *World Dynamics.* Cambridge (238 Main St.): Wright-Allen Press, 1971.

Dennis L. Meadows, *Dynamics of Commodity Production Cycles.* Cambridge (238 Main St.): Wright-Allen Press, 1970.

This paper is copyright 1971 by Jay W. Forrester. It is based on testimony for the Subcommittee on Urban Growth of the Committee on Banking and Currency, U.S. House of Representatives, on October 7, 1970. This text has appeared in the January, 1971, issue of the *Technology Review* published by the Alumni Association of the Massachusetts Institute of Technology.

All figures are taken from the manuscript for *World Dynamics* by Jay W. Forrester, Wright-Allen Press, 238 Main Street, Cambridge, Mass. 02142

Jay W. Forrester studied electrical engineering at the University of Nebraska and M.I.T. and made outstanding contributions to digital computer technology in the Digital Computer and Lincoln Laboratories at M.I.T. before joining the Sloan School of Management, where he has developed what has become known as "industrial dynamics." In 1968 he received the Inventor of the Year Award from George Washington University and in 1969 the Valdemar Poulsen Gold Medal from the Danish Academy of Technical Sciences. His book Industrial Dynamics *received the Academy of Management award in 1962 and his* Urban Dynamics *was chosen as best publication in 1969 by the Organization Development Council.*

ROCK : where it's at

KENT P FISHER

From the conception of the embryo, with the gentle reassurance of the mother's heart beat, man is introduced to music. Upon birth the melody of audible sounds is added to the rhythm of the heart and the symphony of life begins. This essay concerns itself with one of the more popular genres of formal music—Rock.

Rock music is the contemporary blending of two very different worlds. The melodic music of Western Europe has been melded to the rhythmic music of East Africa, creating music originally only "American." These two distinct and equally valid forms first met in the second decade of this century in the southern United States. From this blending, known as "Jass," grew the "New Orleans" sounds of the 20s. In the 30s and 40s, Swing (formalized "Big Band" descendent of Jass) enjoyed its greatest popularity. Through this point, melody held sway over rhythm. Then, in the mid 50s, a phenomenon which was to reach into every home in America exploded. With the grotesque bump and grind of Elvis Presley as the vehicle, Rock and Roll began its climb in popularity. It is true that others—Fats Domino, Bill Haley, etc.—predated Presley. But Elvis was the personality that carried this music form into the hearts (and heads) of the American people.

(This presents a major foundation for any discussion of Rock. The enjoyment of listening to Rock music is first *felt* and then, if one wishes, intellectualized. This is true of other types of music, but with Rock feeling is absolutely necessary for understanding and appreciation. I can hardly over-emphasize this point.)

As with any creation of man, there is infancy before maturity. The music of the Rock and Roll era, with its three and four chord wonders rolling by in seemingly endless procession, was extremely primitive in construction. Writing mills cranked out mediocre (at best) songs to a generation only beginning to experience the possibilities of an alternative culture. A formula for the popularizing of music grew out of this generation—a formula without which Rock would never have emerged. It is quite complex and draws from socio-economic as well as esthetic traditions.

In the cultural periods prior to World War II, music was usually a lifelong struggle for the composer and/or performer. It was chosen as a profession, not a diversion, and tended to perpetuate a closed subsociety of masters and pupils. Those aspirants who showed little ability were weeded and thinned until the upper strata of excellence in performance were narrow indeed. It is obvious why the percentage of classical composers of genius is very high taken with the whole of known classical composers. Because of the traditional hurdles one needed to overcome—archaic teaching methods, mastering of many different instruments, etc.—only those of extraordinary ability ever succeeded. How many individuals in 18th or 19th century Europe (or America, or Asia, or Africa) could have become Mozarts or Schumanns but were prevented because they had to spend their lives in situations where the development of musical genius was impossible?

After WWII, with the availability to the consuming public of technology, many cultural changes began to occur. Not only was listening to music available to the masses (as it had been since the invention of the wireless radio), but, through television, the observing of music being created was also enjoyed. This fact, coupled with the mass production of musical instruments and the deep desire of the American "frontiersman" to become civilized (how old were *you* when you first took music lessons?) laid the foundation for a particular kind of music. One that coupled rhythm and melody and then, through technology, allowed the masses to dabble. The emergence of genius in contemporary music was inevitable.

Another new development played a very important part in the blossoming of Rock popularity and more importantly, Rock-genius. This is the composer-arranger-performer combination which was all but impossible in any (modern) music forms except Rock, Jazz, and Folk. In the case of the latter, the rigid structuring of music to carry lyrics in a usually solo-artist situation greatly restricted the creation of musical genius—it is invariably lyrical. Jazz and Rock both meet the criteria for musical creativity, with Jazz relying more on melody and Rock more on rhythm.

When one is able not only to compose music but also to arrange and perform it, the personal feeling that can be carried to the listener is as exciting as one would imagine a concert of Chopin etudes performed by Frederic himself would be! After one wades through the almost overwhelming deluge of trash that floods the music market to reach the brilliance of performers like Leon Russell and Jimi Hendrix, the desired goal—quality—is more than reached. This is not to imply that there are only a very few composer-arranger-performers who produce quality music. There are many groups and individuals, past and present, whose music is very listenable and creative. But, as in any field, genius *is* limited to the very few.

It is very difficult in Rock to separate the music as it is written from the music as it is performed. To illustrate this point, imagine Heifitz or the Romeros performing a Bach concerto. The music as it is written is of a simple melody/*counterpoint pattern. The technique* of the artist transforms a piece that perhaps an amateur could play into a thing of immense beauty. In Rock there are many simple songs that are transformed by technique and improvisation (which occurs often in Rock) into art with the emotional impact of any acclaimed classical piece. I might suggest listening to Eric Clapton play "Nobody Knows You When You're Down and Out" on the album *Layla* (Atco: SD2—704). The sounds Clapton coaxes from his Fender Stratocaster transform an old blues song into a concert of gut-level emotions

difficult to surpass. This is nothing more than a result of genius.

Brilliance in Rock is not restricted to technique alone: Although the expertise of many performers contributes a great deal to the listenability of any given song, style is only rarely enough. There is an abundance of innovative and original composers and arrangers. I have already mentioned Leon Russell, whose unusual ability to construct Rock in novel ways is very refreshing. Hearing "Hurt Somebody" on his first album (Shelter: SHE 1001) with a refrain pattern for a lead-in and first verse dispels any doubts about the excellence of contemporary music. Another composer-arranger-performer of real ability is Frank Zappa. His powerful compositions have been performed by the Los Angeles Philharmonic under Zubin Mehta and were received with enthusiasm by both the audience and the critics.

No discussion of Rock music would be in the least comprehensive without recognition of the contribution of the team of Lennon-McCartney. More responsible for the rise of superior Rock than any other musicians, it was they who broke the monotonous "dance-music syndrome" of 20th century popular music and began experimenting with the many directions music can take, applying them to Rock. In 1963 the Beatle phenomenon surprised and delighted listeners. Critics turned a previously deaf ear to Rock and Roll and the impetus was created for others to investigate the possibilities open to their own individual creativity. From the now dated sound of "I Want To Hold Your Hand" grew Rock, the most spontaneously joyful, and perhaps most representative art form of the so-called counterculture.

To attempt listing the composer-arranger-performers of talent would be difficult and time consuming for both the reader and myself. Individual tastes in music as well as musical styles vary tremendously. There are certainly redeeming points to even seemingly mediocre songs. They are creations of people—attempts by individuals to share personal deep-felt impressions of life. With generally acclaimed works, the joy of listening to and feeling the gifts of the artist surpasses, for many, most other pleasures of life.

In the cultural world that awaits us in the future, retrospective and unbiased critiques of Rock will most certainly be written. In that time, not only the few artists mentioned here but undoubtedly many others will join those composers of past ages revered by our own culture as "classical greats." Brilliance is not restricted to any favored era and as long as man exists on Earth there will be evidence of that brilliance. Our time is no exception. Through the ever-changing scene of contemporary man, his music *will* accompany him on his journeys through space and time. Its power is limitless—encompassing the softness and fragility of an infant's breath and the ragings of an exploding universe. Stop—and listen. ●

two poems
two poems

ON DYLAN'S NEAR ARREST

TODAY
dylan
was pulled over
* * *
by one
of scottsdale's
uniformed officers
and told he was
illegal
* * *
dylan
who is all of
21-months-old
was
nude
from the waist
d
o
w
n

this
Act/set/off/the/man/and
dylan
was sent inside
with the comment
that it ain't just
quite right to show
your unclothed self
at the ripe age of
almost two because
you never know who
just might be watching
* * *
dylan
was a near-criminal
for premature penis
exposure
thereby
jeopardizing
his hopes for
the white house

P.A. Luce

LOVE?

Sparkling are the eyes
Downy are the cheeks
Soft is the mouth
Warm is the look
Is it love?

Gentle is the touch
Warm are the breasts
Meandering is the trace
Enclosive is the embrace
Is it love?

H. J. Hohenstein

VALUES and economic science

TIBOR R. MACHAN

In his classic work, *SOCIALISM,* Ludwig von Mises argues that a socialist economic system cannot function because there cannot be a viable price system for purposes of the proper allocation of resources. Mises argues economically. But there is a moral formulation of the same argument without which the Misesian argument is not conclusive.

Mises' argument falls short of proving the unworkability of socialism. He fails to show that for those who run the economy *it is wrong to do so.* If it is not wrong to plan, then the resulting "inviable" price system is not wrong either. In short, the inviability of a price system is not, in itself, grounds for rejecting it. The assumption which underlies Mises' conclusion that socialism ought to be avoided is a prior moral principle, namely that it is wrong to undertake such inviable courses of action as planning an economy. Furthermore, the metaphysical assumption underlying the inviability of the price system is intricately tied to the reason for and purpose of a viable price system, respectively (a) the accommodation of man's nature as an agent (or choosing being) and (b) the possibility of choosing rightly when various alternatives exist (which is the purpose of the *viable* price system, i.e., making possible the exercise of good choices in the market place).

Mises and others assume the Objectivist ethics and politics, that is why they consider socialism irrational: it does not satisfy human needs or wants. But they fail to realize that the results of socialism can be considered undesirable and to be avoided only because it is *morally* right to create political and economic systems which are right for people as people. Laissez-faire economics presumes that it is right for man to pursue the goal of satisfying his needs and wants. Its underlying moral principle is that it is right for man to live, to choose freely between alternatives available to him, and to strive for happiness. As Rand puts it, the standard of morality is human life, and its purpose is human happiness (for each moral agent individually).

For Mises and some of the Chicagoites to claim that economics is a "value-free science" and then argue for the free market economy is to be involved in a contradiction (at least implicitly): for how would we determine if the free market is more viable or effective if no standard of viability and/or effectiveness exists? What would such a standard have to be if not a standard of what is right or better for human beings? And what is this if not moral philosophy?

Many libertarians hold that moral principles ("preferences") are indefensible in line with scientific standards. The radical breach between fact and value rests on their mistaken epistemologies (Kantian for Mises, logical positivist for Friedman, operationalist for others, etc.). These epistemologies still divorce rationality from reality and entail that knowledge is possible only by reference *either* to first principles (a coherence theory of truth) *or* experience (the correspondence theory).

Pure logic (rationalism) will not render ethics a truly scientific study, since ethics concerns itself with man's life, with a biological phenomenon. Pure experience (empiricism) won't render ethics scientific because it cannot account for causality and so it must either consider morality irrational or non-existent (in line with the empiricist's Humean determinism). The former turn is taken by the Existentialists, especially by Sartre, the latter by behaviorists, emotivists, mystics, etc.

However, if neither pure reason nor pure experience is possible for human beings nor capable of explaining scientific knowledge, then neither can be considered a source of knowledge. This is why it would be incorrect to claim that knowledge of moral (and other) values is impossible simply on the grounds that what we consider knowledge of values is not obtained in the way rationalists and empiricists claim that knowledge must be gained. Kantian and postivist theories cannot account for scientific knowledge even when it comes to physics or biology. It is quite despite their expressed epistemological foundations that the scientists' activities produce knowledge; they are, after all, human beings and *can* gain knowledge even if they and other fail to

explain correctly *how* they gain it. It has been shown, by Thomas Kuhn for example, that the philosophy of science is in serious need of revisionism. The ideas of contextual certainty, of contextual definition, and of the function of free will in human consciousness need to be made applicable to the methodology of the sciences, including ethics.

(An excellent work which deals with the philosophy of the social sciences, including the role of values in studying man and his social life, is *Explanation and Human Action* A. R. Louch, UC Press, 1969.)

It is possible, then, to understand why so many economists claim that economics is 'value-free". They *must mean* simply that it is not *within* economics as such that the basic moral presuppositions of human life, including economic life, are justified. Therefore, they do not proceed with an explicit concern for and with moral values. But they certainly presume them; and their presumptions are (often) clearly identifiable.

It is their attempt to deny this dependence and commitment, in the case of free market economists to political (therefore also economic) liberty, that sets them at odds with those libertarians who are convinced that the moral bases of a free society are scientifically defensible. ●

letters

VOUCHER CONTROVERSY

I think it unfortunate that a magazine named *REASON* printed Robert Poole, Jr's article supporting a theft-financed school voucher system.

Rational men cannot and do not tolerate rights violations in their society. You would not find a John Galt, for example, advocating a scheme which steals from some men and gives to others (stealing is the act of taking possession of a man's rightful property without his consent).

The highest, most noble ends in the universe cannot justify the means of achieving them when those means violate a man's rights. If you want education on a moral basis - get the state *OUT!*

Brian Eenigenburg
South Pasadena, Calif.

Mr. Poole replies:

Rational men who choose to continue to live in a society which violates rights must determine the most *effective* ways to promote change in the direction of increased legal recognition of rights. Merely stamping one's foot and "not tolerating" rights violations does nothing to change the system.

As I took pains to point out, for a number of reasons I think education vouchers offer the single best hope of creating the necessary *preconditions* for ending tax financing of education, namely, the creation of a large number of competing private schools and the development of a consumer orientation among the purchasers of educational services. Persons such as Mr. Eenigenburg should keep in mind that proposed voucher systems do not inherently *add* any new coercion or taxation to that which already exists; they merely cause a (highly desirable) change in the way the tax money is disbursed.

Opponents should also note that the voucher system is the only major educational reform with any reasonable chance of being adopted calling for tax execptions or the abolition of tax financing of education may sound nicer, but it is basically wishful thinking at this point in time. Libertarians should identify and work for evolutionary reforms that have some reasonable chance of success, rather than talking to themselves or tilting windmills.

COLLEGE PAYMENTS

I enjoyed the "Trends" column, **PAY AS YOU EARN** *(REASON,* June 1971), as your answer to Jencks' question of how most students would ever afford to attend college if the taxpayers did not provide the funds.

I think the PAYE plan is a market answer to the problem of students who wish to attend college but cannot immediately afford to. However, there are two points in the opening paragraph of the column that I would not readily concede

First, Jencks' implication that "most students" should have a college education, and, secondly, the implication of your statement that "corporation grants in exchange for work commitments are generally unwieldy and inflexible."

This second point suggests that the corporations therefore cannot play a large role in funding college education. This may be true in the liberal arts area, but I don't think that it is true in the technical areas, as the Center for Independent Education's ReportNo. 1 suggests. [The report concerns the General Motors Institute and is available from the Center, 9115 East Thirteenth, Wichita, Kansas 67206.]

PAYE is only one of the many solutions that the market would provide. That attending college is a waste of time for many and that sources of corporate financing of education would open up a market could be equally important in the market's functioning to provide education.

Sincerely,
George Pearson
Wichita, Kansas

FED UP—COMMENT

From Jim Wilson's critique of rock music ("Fed Up With Rock," *REASON*, June 1971), it appears that the only rock he has heard comes from top 40 radio, since all of his examples (except for the Dylan) are of the sort typified by commercial "bubble-gum" stations. Apparently nobody bothered to tell him that is the wrong place to look for good music, and this shows in his essay. I anticipate other comments from him after he has taken time to listen to Tim Buckley, Emerson, Lake and Palmer, Jefferson Airplane, Crosby, Stills, Nash and Young, Carole King, Carly Simon, Loudon Wainwright III, Randy Newman, Van Dyke Parks, the Mamas and the Papas, Laura Nyro, Pentangle, the Beatles, Donovan, and Joni Mitchell.

Judith Weiss
Dallas, Texas

SOCIAL CHANGE-COMMENT

In Robert Poole's article, "Leverage Points for Social Change" (*REASON*, June 1971), he cites, as an area of concern, formulations of problems that preclude all but a limited class of answers. Then he does something similar in the Postscript.

He asserts that there are only three fundamental paths to social change: violent revolution, withdrawal to produce collapse (a la *ATLAS SHRUGGED*), and evolutionary change from within. I can think of at least one other class of approaches (a member of which was responsible for the creation of this country): alternatives to present institutions.

The most straightforward application of this type of approach is simply for those persons interested in freedom to leave the unfree society in which they find themselves and build a new one elsewhere. This is the approach that I, personally, intend to follow in my plans for Open Sea habitation. The population of the United States is, as I alluded, the foremost example of this approach in history. But there are other, less drastic, versions of the approach as well.

Clandestine violation of the law can affect great changes in existing institutions. Violation can get to be so widespread (speak-easies during Prohibition, betting on horses with bookies in New York) that the laws are, for all practical purposes, dead letters even before they are finally changed (repeal of Prohibition, creation of legal off-track betting in New York). In other cases, the actual violations may be relatively small in extent at any given time, but the threat of a much more widespread violation may serve as a check. An example of this would be the situation in regard to "pirate" radio off England. At the height of the offshore radio boom, less than half a dozen stations were operating in the black, although a similar market in the United States would support dozens or hundreds of profitable operations. However, the possibility that there would be a large increase in the number of radio ships spurred the British government into legalizing an onshore popular-radio service. A more significant example would be the operation of the Swiss currency markets as a check on governmental economic policy. The volume of trading represents a small fraction of the total currency in circulation; however, the specter of such panics as the recent days on which billions of dollars were converted to other currencies forces governments to put their economic policies in some semblance of order before things collapse altogether (as in Germany in the 1920's).

Semi-clandestine activities can also be useful. The authorities are aware of the existence and location of most communes and other utopian communities; however, because they are out of the way, they can get away with much that would not be tolerated in more conspicuous locales. Which ever of the above approaches one finds best suited to one's objectives, this class of approach should be given more serious consideration than it usually is in libertarian planning.

Erwin S. Strauss
Santa Barbara, Calif.

DETERMINISM AND FREE WILL

Tibor Machan ("The Schools Ain't What They Used to Be . . . And Never Was," *REASON* April/May 1971) holds that determinism entails the conclusion that both affirming and denying the truth of the statement "Free will does not exist" must have equal value. This is clearly a *non sequitur*. If everything in the universe has one or more causes, if nothing is "simply there," indeed we can say that it is determined, that it "had to happen." This is also true for the human mind. Our judgments of whether something is the case are indeed determined. This does not entail that these judgments have equal value, i.e., that they are equally accurate descriptions of reality. It only entails that it is determined who will at a given moment make true or false judgments (to paraphrase this: someone with perfect knowledge of the initial state of affairs and the laws of our universe would also know who will at a given moment make true and who will make false judgments).

As Ludwig von Mises has shown in his *THEORY AND HISTORY*, determinism need not lead to fatalism either in educational or other matters. Determinism does not deny that human beings "really" act or think, it simply holds that those thoughts and actions are not ultimate explanations. They can be analyzed further up the ladder of causes and consequences, e.g., by having recourse to biology and psychology.

Guy de Maertelaere
Ghent, Belgium

STOP THE WORLD—I THINK I'LL GET OFF!

I've just completed re-reading *REASON'S* commentary on social change (June 1971) and find myself wanting to make a few comments of my own (A little bit of that reader feedback you're looking for).

trends

This column reports significant events, publications, and analytical findings associated with the growing rejection of corporate liberalism and the concurrent rediscovery of laissez-faire principles. By reporting and publicizing such items, the REASON community can help ensure that they do indeed represent trends, not merely isolated instances. Readers are invited to submit material for this column.

THE REVOLUTION COMES TO BRITAIN

When Edward Heath was elected Prime Minister of Great Britain, few people expected any significant changes in government policy. To be sure, 25 years of crushing taxation, nationalization, and interventionism have severely reduced Britain's productivity and ability to compete, but Heath's rather bland record gave little indication that his policies would be other than middle-of-the-road.

Yet Heath's decision to let once-mighty- Rolls-Royce go bankrupt rather than prop it up with huge subsidies "sent a deep shock wave rippling through Britain's business community" and focused world attention on what appears to be Heath's grand design to restore capitalism in Britain. Besides Rolls, the nation's largest shipyard (Upper Clyde Shipbuilders), grown fat from subsidy and government paternalism, and a charter airline (Skyways Coach Air, Ltd.) have been allowed to go bankrupt despite pleas for government aid. The Heath government refused to provide a subsidy for the proposed BAC–311 airbus (a sort of British version of the Lockheed L–1011), thereby killing the project. And it has also stopped the long-established policy of giving price preference on government computer purchases to giant International Computers, Ltd. (ICL).

In making these moves, Heath and his Secretary of State for Trade and Industry, John Davies (formerly of British Petroleum), risk political suicide at the hands of both age-encrusted corporate boards and militant unions. But Heath and company are sufficiently convinced of the failure of state interventionism to be willing to take the risk. Businessmen worthy of the name support Heath's moves. Deputy Chairman Bernard Scott of Lucas Industries calls Heath's policies a "revolution" to make people and firms "accept the consequence of their acts without pampering." And Arthur Bryan of Wedgewood, Ltd., thinks Heath should go much farther toward restoring economic freedom: "Let it rip . . . Now we have the worst of all worlds– a lot of restrictions and only a little freedom."

Heath apparently has only just begun. He and Davies are now eyeing the large number of government-owned businesses, devising plans to sell parts of some and all of others. First to hit the market were 200 pubs and a brewery (taken over during World War I). Next in line will be Thomas Cook & Sons, a travel agency (taken over in World War II).

A number of subsidiaries of the nationalized British Steel Corporation, National Coal Board, Central Electricity Board, and the Gas Council may be sold off, as may various properties of British Rail. Several choice airline routes were recently taken from state-owned BOAC and given to newly-merged Caledonian/BUA– Britain's first scheduled long-haul private airline in decades.

Outright attempts to sell the large industries, such as the utilities and transportation companies, would be politically impossible at present. But a promising alternative known as the "BP Solution" may serve as the necessary transition step. British Petroleum, Davies' former company was once fully government-owned but was later incorporated and a majority of the shares were sold to the public. The British government still retains 49% stake and a say in management; but BP is now able to operate much like a private firm, and the government can easily sell off more of its share without shaking things up. The Chairman of British Steel has already suggested this idea to Heath; given Davies' background, it may not be long until the plan is tried.

SOURCES:
"Britain Creates a Private Airline," *BUSINESS WEEK,* 9 January, 1971.
"Reversing the Tide of Nationalization," *BUSINESS WEEK,* 30 January, 1971.
"Britain Stages a Technological Retreat," *BUSINESS WEEK,* 13 March 1971.
"Heath Tries 'Industrial Darwinism," *BUSINESS WEEK,* 20 march 1971.
"Aid Cutoff Dooms British Shipbuilder," Associated Press, 14 June, 1971.

AND REVERBERATES ROUND THE WORLD

Britain is not the only place where the nationalization trend is being reversed. The experiences of countries that have tried nationalization should be cause for sober consideration, placing economic facts ahead of nationalism. In Uganda, for example, the government which came to power last January has announced a severe cutback in former president Obote's plans to take over 60% ownership of the country's largest industries, banks, and commercial establishments. According to the *NEW YORK TIMES,* "Obote's policies had shattered confidence among private investors, brought new investment to a virtual standstill, caused a rapid outflow of capital, and saddled [the government of] Uganda with a huge compensation bill." The seven concerns whose takeover agreements were signed before January will still be taken over, and the government will take a 49% interest in 11 others. But

Lynn Kinsky put it quite succinctly ("Anthropological Perspective on Social Change") when she used the term "meddling in other people's lives" synonymously with the promotion of social change. However, I cannot agree that "responsible meddling" is anymore justified than the irresponsible kind on a concerted level, e.g. agencies functioning under the aegis of governmental control or subsidization are most, if not all, of the sociological elements now in existence.

Quite frankly, I cannot see how anthropology, functional or otherwise, can be of much value in this particular context. The fact that some institution or custom exists within a given culture does not tell me why it exists or whether it is of benefit to me.

If I am willing to accept anthropology's premise that by studying the forest I shall ultimately come to understand the nature of a tree, all is well and good. However . . . . .

Another point presented in this article, stemming, I presume, from the discipline of functional anthropology is that one must now learn to interpret what another is saying, not by the words used but by the meaning implied behind those words. Granted that words can imply a great deal more than dictionary definitions when colored emotionally or when used in different context, but the initial meaning remains fundamentally the same. I'm quite sure Miss Rand did not imply that those who have taken the time and trouble to incorporate a firm grasp on the conceptual meaning and use of their language should chuck it all in favor of grunts and groans! As to taking people at their word, should I or should I not believe this article?

The professor's admonition to his engineering class has little to do with the end product involved—a safe car. (All factors involved, I wonder if *such a thing is possible.*)

In the final analysis, I could say that as a homeowner I have a social responsibility to keep my front sidewalk clear of obstructions for pedestrians, but this would hardly place me in the "evil altruist" category! Moreover, I would certainly question the rationality of one who claimed it did, figuring that person to be a pretty sad case!!! (I must note, however, that I *don't* think in terms of social responsibility but in terms of *my* responsibility, finding it less cumbersome, among other things, in the long run.)

From their onset, the "think tanks" have rallied strong aversion from within. The idea of x number of professionals spending their time and energy cooking up various and sundry changes to affect "us poor mortals" turns me off, to say the least! (As avid science-fiction fan, I've shuddered more often than not when reading of the collective efforts of a benevolent intelligensia, whose "think tank" existence was based on the premise that they were better suited to decide the structure of a given society than those living within it! Of course, it's very possible that they are better thinkers, but the temptations of authority are too strong, given the nature of man, to believe that *anyone* is capable of constant objectivity in all things at all times. Even John Galt went out of context, once!)

Don't misunderstand, I've no qualms about new ideas that stem from an individual who will attempt to put them over in an open market. But I fail to see the difference between "liberal" or "libertarian" meddling so long as it extends from the same coercive arm! Does the value of an idea or experiment justify any method for its implementation? I've yet to discover a human consciousness as supremely objective as reality. That reality may be a slow and even painful teacher, I do not in any way dispute.

When Robert Poole attributed New York's condescension to abolish rent controls ("Leverage Points for Social Change") to RAND's logic and stressing of facts, I saw this as a typical example of objective reality in motion. What politician or social scientist (yipes!) would have considered that same RAND analysis twenty-five years ago before reality had permanently established the economic disaster inherent in their initial plans?

Unfortunately, the method pursued by these same politicians, et al. indicated to me that they still don't believe the facts confronting them but that, at this stage of the game, they're willing to try anything once provided it gets the city out of its economic difficulties!

It is for this reason that I doubt the feasibility of stressing values apart from principles. Maybe it was gotten away with this time, but what happens when some new ideas comes up? Pragmatically, it seems to be of value ("good for now"), but unless a prinicple is maintained how can one implement a viable foresight into the picture?

Libertarian ideals as such are not new, but the fact that they have been more fully integrated and philosophically defined, e.g. Objectivism, is. The point I'm trying to make is this: unless the individual remains the basis for the perpetration of these ideals through example and practice, the so-called social change (my definition—the changing of individual ways of thinking and doing within a given society) hopefully sought just beyond the next hill will continue to remain a Utopian gleam in all our eyes.

Robin King
Conshohocken, Penn.

another 62 which had been in line for takeover will be left entirely in private hands.

In Venezuela, the Caracas City Council has voted unanimously to abolish the city owned bus system in favor of a new mass transit corporation to be created jointly with private capital. The existing bus line, run as a "public service," has been losing over $3 million a year, keeping less than 200 buses running on only 25 of 46 former routes. Political pressures have prevented fares from rising and bureaucratic mismanagement has allowed organizational stagnation. (In addition, Caracas allows free-market jitney operations: privately-owned cars which charge twice the bus fare, carry up to five passengers, and operate without routes or schedules. Regular taxis charge four times as much.)

The third recent case of denationalization (or "reprivatization") is found in the United States. Little known to most people, the federal government owns and operates two airports—Dulles International and Washington National. When FAA Administrator John Shaffer couldn't come up with a solution to rising cost problems, he jokingly suggested selling the two airports. The Office of Management and Budget (OMB), under the direction of George Schultz, didn't think it was funny and has included the proposal in the Budget.

SOURCES:

"Uganda President to Curb Nationalization Plans," *NEW YORK TIMES,* 2 May 1971.

"Caracas Reforms Its Bus System," *Ibid.*

"Soft Sell," *AVIATION,* 8 February 1971.

publisher's notes

• Editor Tibor Machan's paper "On Pursuing Utopias" (which was warmly received at the World Future Society's First General Assembly in Washington, D.C. this May) will be published shortly in *THE FUTURIST.* The magazine is published bimonthly by the World Future Society, Box 19285, Twentieth Street Station, Washington, D.C. 20036. Subscription price is $7.50 per year and includes membership in WFS.

• We have learned that *INNOVATION* the excellent and expensive magazine of The Innovation Group has accepted an article on libertarianism. The author is Robert Patton, a graduate student and lecturer in physics at Hunter College (and a *REASON* subscriber). *INNOVATION* is published monthly at $35 per year by Technology Communication, Inc., 265 Madison Avenue, New York, N.Y. 10016.

• Several people associated with *REASON* have chapters in a recently published book on campus riots. The book is *THE UNIVERSITY UNDER SIEGE,* (Los Angeles: Nash Publishing, 1971) edited by Jaquelyn Estrada of San Diego. *REASON* Editor Tibor Machan and *REASON* contributor Cheri Kent coauthored "The Misuses of the University." Contributing Editor Larry Friedlander and several young students of Objectivism wrote other chapters in the book.

• The Spring of 1971 issue of *THE PERSONALIST,* a scholarly journal of philosophy edited by Professor John Hospers, contains the proceedings of the First Annual Political Philosophy Conference, held last fall at the University of Southern California. The conference was sponsored by the Institute for Humane Studies of Menlo Park, California, and was coordinated by Professor Hospers and Editor Tibor Machan. The theme of the conference was "The Nature of a Humane Society and Its Institutions for Maintaining Justice." Participants included Professor John Nelson, Nathaniel Branden, Sidney Hook, and others.

• Follow-Up to Previous Article—Robert Poole's article "Leverage Points for Social Change" *(REASON,* June 1971) discussed the New York City Rand Institute's devastating report on rent control and described the City Council's covert plan gradually to phase out rent control. Since then, events have moved faster than anticipated. Apparently emboldened by the Rand report, Governor Rockefeller (long a rent control backer) finally switched sides, stating "The time has come to look beyond the politics of rent control. It is time to face the truth that the present rent-control system . . . actually aggravates the shortage and deprives people of housing." At Rockefeller's urging, the Legislature passed a bill removing control from all vacated apartments, prohibiting the City from imposing more stringent controls on apartments currently occupied, and decontrolling all apartments not used as the tenant's "primary residence."

The extent to which supply and demand have been artifically separated may be gauged by a look at Rand Institute's estimates of the probable rent increases. For pre-1947 apartments that become vacant, the average increase will be $50 per month, with many of the better apartments' increases running as high as $150. Up to 200,000 of the 1.3 million pre-1947 apartments are expected to become vacant this year. Rents for new tenants in the 400,000 post-1947 apartments (first put under rent "stabilization" in 1969) will also rise substantially for new tenants. Meanwhile, families who remain in the pre-1947 apartments will still pay the 7½% annual increase previously voted by the City Council in their phased decontrol plan.

• The April 1971 issue of *PEACE PLANS* contains several exhaustive, carefully-researched articles by Editor J.M. Zube, covering "Voluntary Education, Voluntarily Financed," "Free Immigration," and "Voluntary Taxation in a Voluntarist Society." *PEACE PLANS* is available at $2 for 4 issues or $5 for 12 issues from J.M. Zube, Wilshire Street, Berrima, New South Wales, Australia.

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I would like to correspond on philosophical/scientific issues with objectivists of exceptional intelligence working in the sciences. Ron Merrill, Chemistry Department, University of Oregon, Eugene, Oregon 97403.

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